

AiPOL

Australasian Institute of Policing

Journal of the Australasian Institute of Policing Inc.

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law enforcement?**

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Contributions

Articles on issues of professional interest are sought from Australasian police officers and police academics. Articles are to be electronically provided to the Editor, corogers@csu.edu.au. Articles are to conform to normal academic conventions. Where an article has previously been prepared during the course of employment, whether with a police service or otherwise, the contributor will be responsible for obtaining permission from that employer to submit the article for publication to Australasian Policing.

Contributors are expected to adhere to the Journal's publishing guidelines. These guidelines are available in this Journal. All papers are peer-reviewed.

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A photograph showing the rear of a blue car on a paved road that curves to the right. The road has white lane markings. The background is filled with green trees and foliage, suggesting a suburban or rural setting. The car's rear light and 'TDI' badge are visible.

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Editorial

DR AMANDA DAVIES

Editor, Assistant Professor Policing and Security at the Rabdan Academy, Abu Dhabi

It is with great pleasure that I take up the position as editor of the AiPol Journal, having been involved for a number of years as an educator and researcher in the world of policing and security both in Australia and other countries. The journal continues to inform practitioners and academics alike about the important topics in global policing as well as domestic issues. This edition focuses upon the important theme of technology and policing.

The rapid pace at which the global environment is exposed to the affordances of technology developments places often perceived unrealistic expectations on law enforcement to understand how this is impacting on the safety, security and privacy of communities. This edition of the journal has drawn together a 'snapshot' of the range of activities for which law enforcement is scaffolding on technology developments as it continues to police the criminal community and its plethora of technology supported activities. Appreciatively the extent of criminal activities for which technology is at the core are both visible and unsurprisingly overt. Similarly, law enforcement strategies which are underpinned by technology are of necessity both visible, as discussed by Scally (page 48) and invisible to the public, such as Hitachi's AI security system (page 25) and a combination as indicated by the Dubai Police use of biometrics in a Smart Car. The suggestion by John Wulff (page 17) in discussing the existence of fusion centres raises the notion of whether we can assume the technology advances are always realizing only a positive outcome "the use of information technology gives these local agencies access to a vast amount of information and data, for better or worse that would previously be unavailable

The challenge, as ever is to understand the diverse capabilities of technology and their potential for criminal activity and conversely policing that activity.

to them without this technology...". The challenge, as ever is to understand the diverse capabilities of technology and their potential for criminal activity and conversely policing that activity. Professor Rogers, in his article, *Technology, data and reliable prediction* (page 8) also raises the dilemma of reliability of technology, and specifically, software. Here the very real issue of user error or misuse should be cause for continual vigilance and checking mechanisms to optimize the potential of technology. The legalities associated with the developments which were once thought of as 'futuristic' are of international concern. Ranging from voice recognition technologies as discussed by Ghoshal (page 29) to use of facial recognition software as raised by Wulff (page 23) carries with it the pivotal discussion as to whether these activities

encroach the legal rights of the citizens. Reaching beyond the real to the synthetic, Bryson, Diamantis and Grant (page 31) discuss the current legal argument being considered by the European Union, to confer legal personhood on purely synthetic entities.

What does this mean for law enforcement agencies? There is no definitive answer, what is important is a co-operative and collaborative proactive strategy across the global policing landscape to continue to share experiences with advances in technology as they have been applied in law enforcement. This approach has the potential to encourage avoiding 're-inventing the wheel' and promoting the technology advances that are aiding the successful policing of the ever evolving criminal intent.

Welcome to our new editor Dr Amanda Davies

LUKE FARRELL

Secretary, AiPol

The Australasian Institute of Policing (AiPol) welcomes Dr Amanda Davies to the Chair as our AiPol journal editor. Amanda brings with her a wealth of knowledge in relation to policing and law enforcement and we are privileged to have her performing this important role on behalf of AiPol.

It would be very remiss of AiPol not to acknowledge the significant work that has been carried out for a number of years by our dear friend and colleague, Professor Colin Rogers, in his capacity as editor of our journal.

We all have busy lives and time is precious. When academics of Amanda's and Colin's calibre give their valuable time to our Institute it is greatly appreciated. Colin will continue to assist AiPol in other capacities, for which we are again grateful.

AiPol gives all of us the opportunity to share information and knowledge with colleagues across our law enforcement and national security community.

It is the dedication of Colin, Amanda and others that ensures that AiPol continues to have a voice of reasoning and sound principles. AiPol, through its publications does not just inform our members but helps initiate legislative and policy change to the benefit of all those within the policing and law enforcement community.

So, once again we welcome Dr Amanda Davies and provide a summary of her achievements to date.

Dr. Amanda Davies Profile

Dr Amanda Davies is currently on a term posting as Assistant Professor Policing and Security at the Rabdan Academy, Abu Dhabi. Lecturing in the Policing and Security program for the Abu Dhabi Police and Military. Dr Davies is also a Senior Lecturer with the School of Policing, Charles Sturt University (CSU). Dr Davies has been with the School of Policing based at the NSW Police Force Academy since 2002.

As a member of the senior management team at the School, Dr Davies has undertaken a wide range of academic management roles including curriculum development, curriculum evaluation, e-learning curriculum development and staff development. Since 2002, Dr Davies has lectured at the school, more recently managing the transition of whole of course delivery to the online environment.

Dr Davies research focus centres on development, utilization and evaluation of simulation for developing policing knowledge and skills. In particular the influence of simulation based learning on an officer's operational practice.

Dr Davies has received awards for her teaching and research. In 2009 receiving a Vice Chancellor Award for Teaching Excellence and an Australian Learning and Teaching Council Citation for Teaching. In 2008, 2009 and 2015 presenting award winning co-authored conference papers.

Research

Evaluation of the implementation of NSW Police Force Body-worn Video Cameras Phase Two Deployment (funded by NSW Police Force Major Events and Incidents Command)

This research project follows on from the Phase One evaluation and is designed to report on the impact of the implementation of Body-worn video cameras by NSW Police Officers in their operational duties.

Exploring strategies to support Indigenous applicants and officers for the New South Wales Police Force (funded by the NSW Police Force Aboriginal Programs Unit)

This research project is designed to identify barriers for Indigenous applicants to the New South Wales Police Force and their retention and/or progression.

Evaluation of the NSW Police Force Active Armed Offender Training Program (funded by NSW Police Force)

Research funded by NSW Police Force Weapons and Tactics Division

This research:

- Evaluation of the impact of the level of preparedness of NSWPF officers after AAO training; and
- Evaluation of the curriculum alignment with assessment

Evaluation of the NSW Police Force Take the Lead Leadership Program (funded by NSW Police Force)

Research funded by NSW Police Force Senior Leadership Executive, Education and Training Command

- Evaluation of the impact of the training on NSWPF officers' leadership competence after training

- Evaluation of the curriculum alignment with assessment; and
- Evaluation of the adequacy of the technology supported simulation based learning exercises in the training program

Evaluation of the implementation of Body-worn Video Cameras Phase One Deployment (funded by NSW Police Force)

Research funded by NSW Police Force Public Order and Major Events Command to evaluate the impact of the Body-worn video use by NSW Police Officers.

- The research report recommendations have been adopted by the NSW Police Force for implementation in the Phase Two deployment;
- The research report has been presented to the New South Wales Government Treasury Gateway Committee in support of the application for funding of the Phase Two deployment;
- The research report has been presented to the Victorian Parliament (by the Victorian Police) in support of the deployment of Body-worn video cameras for Victorian Police Officers.

Development and evaluation of a Self-Assessment Rubric for Simulation based learning exercise programs (funded by NSW Police Force)

Research project in collaboration with the NSW Police Force Simulated Operations Unit, Education and Training Command, Sydney.

- This project resulted from recommendations presented in my Doctoral thesis.
- The research project was awarded a Best from around the Globe prize at the Simulation Australia Conference which funded the author to present the paper at the USA I/ITSEC Conference, the world's largest simulation conference.

Evaluation of the Pre-attestation phases of the Associate Degree in Policing Practice for preparing Probationary Constables for operational duty (funded by School of Policing)

Report prepared for: Principal, NSW Police Force Academy, Head of School of Policing Studies and School of Policing Courses Committee

This research project reported on the design and delivery of the pre-attestation Associate Degree in Policing Practice curriculum and included the view point of the probationary constables, field

based supervisors and NSW Police Force management.

Evaluation of the Pre-attestation phases of the Associate Degree in Policing Practice teaching staff feedback on teaching/curriculum 201515 funded by School of Policing)

Report prepared for: Principal, NSW Police Force Academy, Head of School of Policing Studies and School of Policing Courses Committee.

This research project reported on the design and delivery of the pre-attestation Associate Degree in Policing Practice curriculum from the teaching staff perspective.

Evaluation of the IPROWD (Preparation program for Indigenous NSW Police Force applicants) Curriculum (funded by NSW Police Force)

This research project reported on the adequacy of the IPROWD curriculum and delivery in preparing students for the study of the Associated Degree in Policing Practice and the NSW Police Force probationary constable operational duties.

Evaluation of NSW Police Force Integrated Tactical Skill curriculum

What impact on tactical option decision making skills for recruit police officers is achieved through an integrated police tactical skill training approach.

This research project reported on the adequacy of an integrated tactical option decision making skills curriculum for supporting student learning.

Doctorate Thesis (funded by Charles Sturt University and NSW Police Force)

The impact of simulation-based learning exercises on the development of decision-making skills and professional identity in operational policing

This research project:

- reported on the impact of Hydra-Minerva Simulation exercises within a Incident Command and Control training program for Superintendent level NSW Police Force Officers; and
- reported on the impact of virtual shoot/don't shoot decision making simulation exercises (VirTra) for supporting NSW Police Recruit officer training.

Evaluation of a Weapons and Tactics Firearms Training Peer Support Pilot Programme (funded by NSW Police Force)

This research project reported on the implementation of a Peer Support Training program for teaching Firearm skills to NSW Police Force recruit students.

Evaluation of the NSWPF Hydra/Minerva Incident Command and Control Simulation Exercise

This research project was a pilot for the research to be conducted for a Doctoral Thesis.

The research reported on the impact of the simulation based exercise for transferring learning from the classroom to operational practice.

Re-useable learning objects: What is their impact on learning outcomes? A Charles Sturt University Scholarship in Teaching funded project

The research project report:

- Achieved an ASCILITE Best Paper Award
- Presented in the Charles Sturt University Vice-Chancellors report to Senate
- Adopted by the Charles Sturt University Educational Design Unit as an exemplar for distance education course design

Evaluation of the Associated Degree in Policing Practice for preparing NSW Police Recruits for operational practice

(A member of the Associate Degree in Policing Practice review team, reporting on the level of adequacy of the curriculum in developing students for their operational policing duties).

The research informed the continuous improvement process

Publications

Journal Articles

- Davies, A. (2015). Shoot Don't Shoot what are the influences? The police recruit perspective. *Policing and Society An international Journal of Research and Policy*. Taylor & Francis. DOI: 10.1080/10439463.2015.1077835. pp. 1-14
- Davies, A. (2015) Incident Command Decision Making: Perception vs Reality. *Australasian Policing A Journal of professional practice and research*. Vol 7, Number 1.
- Davies, A. (2015) Beyond the Tick and Flick: An Approach to Identifying the Realised Value of Simulation Exercises in Educating for the Future. *International Journal of Innovation and Research in Educational Sciences*. Vol2, Issue 3. pp. 116-119.
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continued on page 7



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- Davies, A., & Dalgarno, B. (2009) Learning fire investigation the clean way: the virtual experience, *Australian Journal of Educational Technology*, Vol 25, Number 1, 2009.

Conference Presentations & Conference Proceedings Papers

- Davies, A. (2017) Listen to the voices from the field: A model for evaluating simulation based learning exercises. Conference Proceedings Australasian Simulation Congress, ICC, Sydney Australia. August - September 2017.
- Davies, A. (2016) Live and Virtual: A model for taking the classroom to the field. I/ITSEC, Orlando, Florida, December 2016.
- Davies, A. (2015) Novice and Experienced Police Officers Simulation Experience – guiding the future. I/ITSEC, Orlando, Florida, December 2016.
- Davies, A. & Sargent, H. (2015). Reflecting and Gaining Wisdom: A self-assessment rubric for optimizing simulation based learning. SimTECH, Adelaide, July 2015.
- Davies, A. & Lynch, H. (2015). Spiralling up professionalism: An integrated model for higher education. 1st International Conference on Higher Education Advances, Valencia, Spain.
- 2015 Davies, A. Beyond the walls: Evidence based research – what does it tell us about simulation based learning for operational policing? ANZ Officer Safety and Skills Conference, Sydney, March 2015.
- 2014 Davies, A. "Simulation based learning environments", CSUed 2014 Albury, Australia.
- 2014 Davies, A. & Lynch, H. Imagineering for police recruit education: a case study. CSUed 2014 Albury.
- 2014 Davies, A. "The Associate Degree in Policing Practice and integrated curriculum and assessment model" Education for Practice Institute, Homebush, Sydney.
- 2013 Davies, A., & Ferguson, D. Police recruit education in 2014 and beyond: Rethinking curriculum design and delivery in police recruit

education. Presentation at Policing and Security in Practice: Then, Now and Into the Future. Sydney, AUS.

- 2010 National Curriculum Quality Assurance Forum, Melbourne " The role of virtual reality in connecting students to their profession". Melbourne, AUS.
- Davies, A. (2010). Lessons From The Field: Exploring The Impact Of Debriefing Simulation Exercises, Conference Proceedings SimTect 2010. Brisbane, Australia.
- Davies, A., & Nixon, J. (2010). Making it real- from the street to the online classroom in police education: what is the impact on student learning? Paper presented at the ASCILITE Conference: Curriculum, technology and transformation for an unknown future. Sydney, AUS.
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- Davies, A. (2015) Report on the Evaluation of the Implementation of Body Worn Video Cameras for New South Wales Police Officers Phase 1. Charles Sturt University, Goulburn.
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- Davies, A., & McDonald, M. (2011) Report on the PPP126 WTTU Firearms Training Peer Support Program. NSW Police Academy, Goulburn.
- Davies, A. (2009). Report on the NSW Police Force Minerva Public Order Simulation Operation May, 2009.

Doctoral Thesis

- Davies, A. (2013) What is the impact of simulation-based learning exercises on the development of decision-making skills and professional identity in operational policing. Doctoral Thesis , Charles Sturt University, Wagga Wagga, AUS.

Book Chapters

- Davies, A. (2013). Using simulations in Police Education. In J. Higgs, D. Sheehan, J. Baldry Currens, W. Letts & G Jensen (Eds.) *Realising Exemplary Practice-Based Education* (pp.239-247). Rotterdam, ND: Sense Publishers.
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- Davies, A., & Roberts, K. (2011). Communications in Policing. In P. Birch & V. Herrington (Eds). *Policing in Practice* (pp.) Sydney, AUS: McMillan.

Sole Authored Books

- Davies, A. (2010) *The impact of re-useable learning objects in education*. Saarbrücken, GR: Lambert Academic Publishing.
- Davies, A. (2005). *Working in Hospitality Operations*. Croydon, AUS: Tertiary Press.

Co-authored Books

- Davies, A., McLean, D., & Watson, A. (2004) *Customers and Colleagues*. Croydon, AUS: Tertiary Press.
- Davies, A., Krau, F., Braham, B., Ellyard, S., & Allanson, J. (2003). *Communication for Business*. North Ryde, AUS: McGraw-Hill.



Technology, data and reliable prediction

PROFESSOR COLIN ROGERS

Charles Sturt University

Predicting the future, and events, is of course not an exact science, and recent political elections and referendums will testify. However, in part as an answer to economic cuts, reduced workforce and resources and other demands upon their services, the police in England and Wales have naturally looked to technology to assist. This technology includes such as automatic identification for vehicle registration numbers, the increased use of drones, hand held computer for officers and of course different types of analyses of data and information to assist in providing adequate resources at high demand times. The use of technology and computer assisted decision making has even reached the hallowed halls of the custody office. Witness reports that Durham constabulary are using 'artificial intelligence' designed to help officers decide whether or not a suspect should be kept in custody. The system classifies suspects at a low, medium or high risk of offending and has been tested by the force, and it has been trained on five years of offending histories data. It is alleged the tool could be useful, and Data for the Harm Assessment Risk Tool (Hart) was taken from Durham police records between 2008 and 2012. Apparently the system was tested during 2013, and the results showing whether suspects did in

fact offend or not were monitored over the following two years. It appears forecasts that a suspect was low risk turned out to be accurate 98% of the time, while forecasts that they were high risk were accurate 88% of the time. Indeed, Kent police, considered to be one of the pioneers of this type of predictive policing in the UK reported that their trial of software based upon data analysis utilizing certain algorithms, was 60% better at spotting where crimes would take place than the force analyst. These kind of initiatives, and similar approaches to the use of data, could well become the norm as police try rationalize their working processes. It appears to fit into the already well-known use of information and data for 'geospace' analysis for crime and incidents and the general intelligence led policing approach. These approaches are of course dependent upon what is commonly referred to as 'Big Data' the analysis of such, particularly the use of algorithms.

Big data and algorithms.

Big data is a term that describes the large volume of data – both structured and unstructured – that inundates an organisation and its business on a day-to-day basis. It includes also the incorporation of other databases to formulate a larger database. Therefore, for the police, recorded crime statistics, stop and search

statistics, victim statistics etc are all part of what could be incorporated into Big Data for the purposes of this approach. Risk assessment algorithms are formula that analysis big data sets which, as in the instance of Durham constabulary, weigh up a variety of factors relating to recidivism or the likelihood an individual will commit another crime, or should be granted bail. Thus predictive policing is based upon the application of analytical techniques, particularly quantitative techniques, to identify likely targets for police intervention and prevent crime or solve past crimes by making statistical predictions.

Creating the data

All data is socially constructed. It contains the opinions, stereotyping, beliefs, attitudes of those people working in their construction. Policing is a people business, and social interactions between people are complex to say the least, especially perhaps in fraught situations. This interaction involves a certain amount of interpretation with citizens to determine whether a formal instance of 'crime' will be produced. In addition to determining whether any part of the criminal code has been broken, officers may consider the behaviour and attitude of those involved in the activity, any organisational pressures to produce more or fewer cases of the



particular type of crime and a variety of other factors, before classifying an action as a concrete example of criminality. In addition, the arrest of a serial offender accounting for many burglaries in a given area would not be known by the software. Thus, the software will continue to forecast or predict the next incident based upon what it knows, which is the crime pattern. Indeed, one of the problems of using algorithms for predictive policing based upon official crime data and information has been identified by the University of Utah as the 'runaway feedback loop'. Here, because of the focus on historical crime data officers were sent back to the same often poor neighbourhoods time and again. Once an arrest was made it influenced the software to rank the area even higher crime risk, and so send more police back the next day, regardless of what the true crime rate was. Thus, the algorithm was engaged in a self-fulfilling prophecy targeted against the same poor and marginalised neighbourhoods. Indeed, predictive tools are inherently biased since they rely heavily upon reported crimes data which is often concentrated in areas that are heavily policed thereby skewing statistics to over represent poor or minority communities. A recent American publication suggested that there was a history of racially biased policing in the United States and that has fed into all the data that they have on where arrests have occurred, what crimes are more likely to be committed and at which particular times. All of this data has been fed into predictive policing. Therefore, biases in the input of data will skew the data sets utilised by the police.

Perhaps the most fractious area of utilising big data and algorithm analysis lies in the world of Geodemographics. This is based upon a foundation of

classifying communities on the basis of social similarity rather than locational proximity. This approach analysis people by where they live, and is widely used in the commercial sector to segment customers and target appropriate services. For police purposes it is useful perhaps for identifying victims of crime pattern, but it can also suggest a relationship between people and things in a cause and effect approach. Places with the same characteristics and behaviour attracts people of a similar type and this in turn reinforces neighbourhood characteristics. Clearly, refusing bail on the ground of a person colour or that they live in a particular area is not just morally wrong, but would be open to legal challenge as well. In addition to these problems, the issue of trust in data management is one of great concern. Recently, a member of parliament in the UK Government highlighted the belief that the police in that country had stored millions of photographs of innocent people on a large police database. These images, it was alleged, were of people who had been released without charge and the database could be used for facial technology recognition. Clearly there are some major issues to consider when it comes to police use of technology and the civil rights of the individual citizen.

Discussion.

Poor quality data is the major problem. Data omission meaning that data are missing from incidents should be acknowledged as well. Not all crime is reported or recorded and there may be non-recorded crimes occurring in areas that are not necessarily deemed 'high crime'.

The primary concern relating to predictive analysis and the use of big

data and algorithms are around the use of computerised algorithms which provide risk scores based on the results of questions that are either answered by defendant or pulled from criminal records, and whether such tools may ultimately penalise racial minorities by overpredicting the likelihood of recidivism in these groups. The use of demographic data would appear to enhance this problem. It is reported that in the USA one software company utilise this approach with the police and allegedly used a biased algorithm since they relied upon factors as poverty, postal codes and employment status, which could have been used as proxies for race as some are more highly correlated with minorities. Ultimately, however, the algorithm itself may not be biased, but the data used by the predictive policing algorithms may be adversely affected by years of biased policing practices.

Conclusion.

The use of predictive analysis is a fairly new and effective way in which the police can satisfy, in part at least, the growing demand for their services and also for visibility by placing officers in the right place at the right time. It has been part of policing strategies in terms of evidence led policing for some time and has shown its usefulness on many occasions. Indeed, there is no doubt that the use of this form of technology will increase as economy and efficiency searches within the police continue. However, the police should not just utilise this aspect alone. Alongside the use of technology there must be better community engagement in order for transparency and accountability in the use of predictive policing. Effective policing still requires officers to build trust with the communities they serve.



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Detective Steven Citta (left) and a coworker investigating a case / Images courtesy of the Hartford Police Department

Fighting crime with Slack

How the Hartford Police Department gathers intelligence in real time.

Shots are fired midday on Park Street in Hartford, Connecticut.

At the Hartford Police Department's Capital City Crime Center (known as C4)—a technology-driven, real-time crime and data intelligence center—a team of analysts uses a combination of audio transmitted from the ShotSpotter software system, along with video from nearby security cameras, to map the location of the incident as units are responding.

They grab a visual of the suspect and pass that information onto Detective Steven Citta, who's responsible for gathering and sharing intelligence to local police units as well as partners

in units and agencies across the entire state.

Units communicate over radios while responding, meanwhile C4 personnel post intelligence collected by analysts to the department wide channel in Slack. As the shooter takes off, C4 provides field officers with up-to-the-minute updates on the whereabouts of the shooter and his description, which they use to locate, positively identify, and arrest him only a few streets away.

"We use Slack to track and share intelligence regarding felonies and pattern crimes," says Citta. "We have a pretty violent city and a rise in narcotics trafficking, so we

use Slack to push out a lot of information about violent crime suspects and generally people who are a threat to our residents or a threat to law enforcement."

Not long ago, details about suspects were handed out on flyers, only to end up crinkled and stuffed into the visors of police cruisers. Later, daily email bulletin blasts solved the distribution problem but still couldn't keep pace with events as they happened in the real world.

These days, the Hartford Police Department's intelligence sharing is primarily coordinated over Slack with more than 450 investigators and officers from all over the state.

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Moving Beyond Trauma is a 5-day residential program at the Quest for Life Centre in Bundanoon, NSW designed to assist people with PTSD reclaim their lives.

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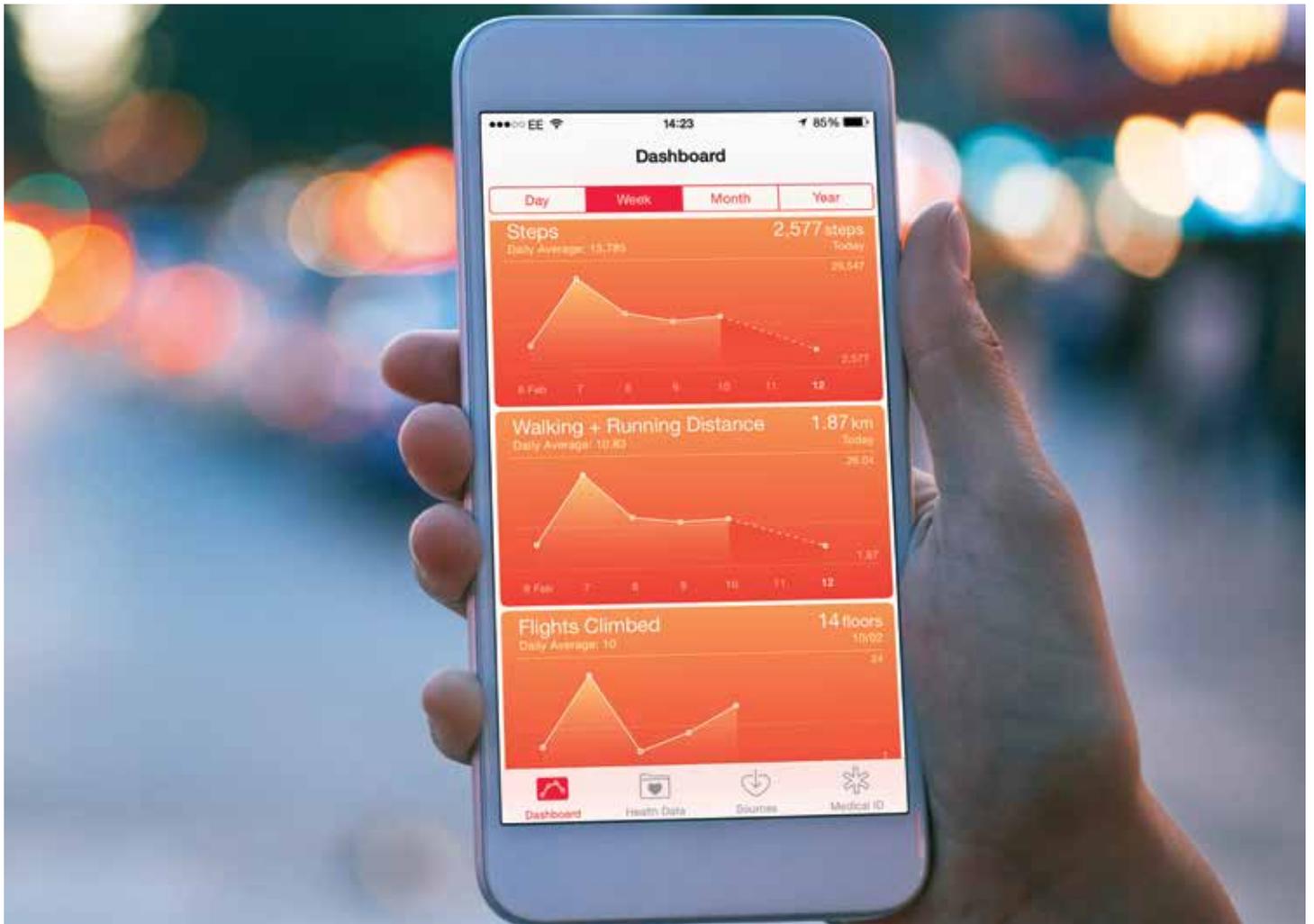
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Apple Health data used in murder trial

January 12, 2018

Health data has provided crucial evidence at a trial in Germany, in which a refugee is accused of rape and murder.

Apple's Health App accurately records steps and has been pre-installed on the iPhone 6S and newer models.

Data suggesting the suspect was climbing stairs could correlate to him dragging his victim down a riverbank and climbing back up, police said.

The accused – Hussein K – has admitted his guilt but disputed some details.

The 19-year-old medical student Maria Ladenburger was murdered in October 2016 and the trial – at the district court in Freiburg – started in September.

Ms Ladenburger was raped and drowned in the River Dresiam.

The suspect – identified by a hair found at the scene of the crime – refused to provide police with the PIN code to his phone so investigating officers turned to an unnamed cyber-forensics firm in Munich, which broke into the device.

The health data app on iPhones records activity – including how many steps are taken, nutrition and sleep patterns as well as various body measurements such as heart rate.

As well as locating Hussein's movements, the phone also suggested periods of more strenuous activity, including two peaks, which the app put down to him "climbing stairs".

An investigator of similar build to the suspect went to the area where the body

was found and recreated how the police believe he disposed of the body.

The police officer's movement data on the same app showed him also "climbing stairs".

"For the first time, we correlated health and geo-data," chief of police Peter Egetemaier told the court, according to German paper *Die Welt*.

Complicating the trial are attempts to pin down Hussein's real age.

He initially claimed that he was 17 but his father, tracked down to Iran, has disputed this.

Age will play a part in sentencing. The maximum for someone under 18 is 10 years, whereas the adult sentence for such a crime could be up to 30 years.

Cops use murdered woman's Fitbit to charge her husband

April 26, 2017

AMANDA WATTS

CNN

The attack, as Richard Dabate described it to police, was horrific.

A masked intruder barged into his Connecticut home, he said, tied up and tortured him and – when his wife came home – shot and killed her.

His story, however, would not hold up with investigators. And when cops ultimately charged him with murdering his wife, they relied on evidence gathered from an unlikely source:

The Fitbit his wife was wearing.



The crime

It was December 23, 2015. Dabate told detectives he put his two kids on the bus that morning, waved goodbye to his wife, Connie, and left for work.

Soon afterward, the wife headed for a fitness class at the local YMCA, with a Fitbit on her waistband.

In his version of the incident, as outlined in a warrant obtained by CNN affiliate WTIC, Dabate said he went back home when he realized he'd forgotten his laptop.

That was between 8:45am and 9am, he told detectives.

He heard a noise, he said, and went upstairs to investigate.

That's where he spotted an intruder, he said: a 6'2" man with a stocky build wearing a "camouflaged suit with a mask."

Right then, Dabate said he heard his wife return home and yelled for her to run.

After a brief struggle, the intruder shot and killed the wife, Dabate said.

At that point, he told detectives the intruder half tied him to a chair and began burning him with a torch.

The two tussled, he said. And at one point, Dabate said he turned the torch on the intruder.

The man "dropped the torch, put his hands to his face, and ran out," he said.



Richard Dabate.

Dabate said he crawled upstairs with the chair still attached to his wrist, pushed the panic button on his alarm and called 911. It was 10:11am.

The Fitbit timeline

Police scoured the area but couldn't find a suspect.

K-9's were brought in to locate any evidence that someone fled the property; the only thing they picked up tracked directly to Dabate, police said.

Investigator said they also found no evidence of forced entry and nothing in the house was taken.

They obtained search warrants for Connie Dabate's Fitbit, both of their cell phones, computers and house alarm logs.

Synchronizing those logs, here's what detectives say they found, according to the warrant:

- At 9:01am Richard Dabate logged into Outlook from an IP address assigned to the internet at the house.
- At 9:04am, Dabate sent his supervisor an e-mail saying an alarm had gone off at his house and he's got to go back and check on it.
- Connie's Fitbit registered movement at 9:23am, the same time the garage door opened into the kitchen.
- Connie Dabate was active on Facebook between 9:40 and 9:46am, posting videos to her page with her iPhone. She was utilizing the IP address at their house.
- While she was at home, her Fitbit recorded a distance of 1,217 feet between 9:18am and 10:05am when movement stops.

If Richard Dabate's claims were correct, detectives say the total distance it would take the victim to walk from her vehicle to the basement, where she died, would be no more than 125 feet.

Technology has increasingly played a larger role in helping to solve crimes.

More evidence mounts up

Dabate later admitted to having an extramarital affair where he impregnated a woman.

Five days after the incident, Dabate also attempted to make a claim for his wife's life insurance policy for \$475,000, police said.

Now, Dabate is charged with murder, tampering with evidence, and providing a false statement.

Last week, he posted \$1 million bond and was released. He is expected to enter a plea during his next appearance in court on April 27.

CNN's calls and e-mails to his attorney have not been returned.

In court, his lawyer Hubert Santos said, "My client is innocent of these charges and he looks forward to being vindicated after a trial."

Technology used to solve crimes

Technology has increasingly played a larger role in helping to solve crimes.

Earlier this year, recordings from an Amazon Echo were used in a murder case.

Amazon had pushed back against a Benton County, Arkansas, prosecuting attorney saying it was setting up a legal battle pitting technology-based evidence against privacy rights.

In the end, the defendant agreed to voluntarily hand over the recordings.

Last year, Ohio investigators used evidence retrieved from his pacemaker to build an arson case against him.

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Artificial Intelligence and Law Enforcement

(Template Version September 2014)

GIAC (GCFA) GoldCertification

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Abstract

After the 9/11 terrorist attacks against the United States, the law enforcement and intelligence communities began efforts to combine their talents and information gathering assets to create an efficient method for sharing data. The central focus of these cooperative efforts for sharing information was state fusion centers, tasked with collecting data from several database sources and distributing that information to various agencies. This vast amount of intelligence data eventually overwhelmed the investigative organizations. The use of Artificial Intelligence (AI) to parse data and extract patterns of behavior that can create actionable intelligence for the recipient agencies is a technology that is desperately needed in order to shape the methodology of critical data sharing for crime and terrorism prevention.

AI can analyze threat data and historical information and then create attack hypotheses for predicting when and where crimes will be committed. Statistical and tactical analysis of criminal and terrorist patterns of behavior by AI's intelligent software agents can provide economical operations and resource management. By predicting the most logical locations for criminal activity, equipment and personnel can be directed to those areas to prevent those events from occurring. Financial resources must be allocated to allow for the development of these applications and for the exhaustive study of test results to ensure the accuracy and efficacy of AI's machine-learning techniques for increasing the crime fighting options available to law enforcement and the intelligence communities.

Introduction

On the morning of September 11, 2001 at 8:46 an airliner carrying 10,000 gallons of fuel crashed into the north tower of the World Trade Center in lower Manhattan. A few minutes later, at 9:03 a second plane hit the south tower. Both structures collapsed in less than 90 minutes. On the same morning, at 9:37 a third airliner slammed into the Pentagon and at 10:03 a fourth plane crashed in a field in Pennsylvania, its target never reached due to the heroic actions of passengers with knowledge of the previous attacks. The human death toll from these events amounted to nearly 2700 (9/11 Commission, 2004).

Nineteen young Arab men, implementing the plans of Islamic extremists in Afghanistan, committed these acts of terrorism. Some had been in the United States for over a year and blended into the population. While four had training as pilots, the rest were not well educated and spoke English

poorly. In small groups they were able to carry knives, box cutters, Mace, or pepper spray onto the hijacked jetliners and convert them into deadly weapons (9/11 Commission, 2004). How did this happen? How were they organized and financed? How did the authorities fail to anticipate and prevent this tragedy?

1.0. Fusion Centers & Information Sharing

These events highlight the inability of law enforcement and the intelligence community to effectively share information. The 9/11 Commission Report found that the United States, while having access to vast amounts of data and information, is ill equipped to process the data that it has. The report suggested that the Intelligence community's culture of "need to know" be replaced with "need to share". Moreover, the report recommends that the President lead an effort to turn an outdated mainframe structure into a distributed network. In

response to these recommendations, the law enforcement and intelligence groups began efforts to combine assets, knowledge, and skills in the pursuit of terrorists and to gather intelligence to prevent further attacks (9/11 Commission, 2004). The central focus of these cooperative efforts for sharing information was state fusion centers.

A state fusion center is defined as "a collaborative effort of two or more agencies that provide resources, expertise, and information to the center with the goal of maximizing their ability to detect, prevent, investigate, and respond to criminal and terrorist activity" (Fusion Center Guidelines, n.d., p. 12). While the exact makeup of the centers varies from state to state, they are mostly comprised of state and local law enforcement agencies, public health and safety organizations, and federal agencies, most notably, the Federal Bureau of Investigation, U.S. Department of Homeland Security, and the Bureau

of Alcohol, Tobacco, Firearms, and Explosives. The mission of fusion centers is to bridge the gap between these agencies, facilitating real-time information sharing. In addition to providing this intelligence, fusion centers provide agencies all-encompassing views of the threat environment (Grant & Terry, 2005). The end product of this mission is a tremendous amount of data that is generated and must be disseminated to the various law enforcement agencies that can best utilize these data.

However, fusion centers have come under great scrutiny from Congress and the law enforcement community because of their perceived inability to digest the amount of data that they are collecting and distribute it in a meaningful way (Sypherlink, 2008). For example, terrorism often involves multiple suspects who are connected through various relationships. It is necessary to use research techniques such as link analysis to digest the information regarding these individuals and treat them like a network in which they interact and participate in differing roles. The adaptability and learning protocols inherent in Artificial Intelligence (AI) make it a solution that can constantly monitor the changing landscape of these criminal and terrorist networks.

A study of this landscape often involves criminal network analysis by studying drug trafficking, fraud, gang related crimes, armed robbery, etc. An analysis of criminal network activity with AI can highlight previously unknown relationships between the actors in the criminal network and can identify and classify the individuals or groups into their appropriate network roles. This combination of network and behavior analysis can also be used to predict the commission of terrorist and criminal events, using the same AI techniques that retailers use in predicting the purchasing habits of consumers.

The purpose of this research was to examine how law enforcement actors can better evaluate data distributed by fusion centers. What would Artificial Intelligence's role be in the aggregation of critical threat data into actionable intelligence? How could Artificial Intelligence be used as an aid to intelligent policing? How could resource management leverage Artificial Intelligence for more effective deployment of resources?

By looking beyond state and national borders, the fusion centers are intended to enhance the ability to predict crime and terrorism, rather than just react to events. Fusion centers analyze information from local criminal activity and can therefore determine whether a connection exists between that activity and terrorist threats. It is possible that the application of Artificial Intelligence to the processing of these data can help with these connections.

1.1. Advancing Law Enforcement

The existence of fusion centers and their mandate to coordinate and disseminate these data has moved the technology of crime fighting into new territories of advanced law enforcement. The use of information technology gives these local agencies access to a vast amount of information and data, for better or worse that would previously be unavailable to them without this technology, and has coined the term, Intelligence-Led Policing (Grant & Terry, 2005).

This information access is increasing exponentially and law enforcement must keep up with the amount of data collected. In order to create actionable intelligence necessary for successful Intelligence-Led Policing, crime analysis is completely dependent upon the quality of the data or information collected and the ability to collate and interpret its meaning. According to Canter (2000), the criteria for designing the data collection processes that will create the greatest possible relevance to the crime analysis are:

1. **Timeliness:** Does the pattern of the data or information relate to the current problem or are they indicative of a previous issue?
2. **Relevancy:** Is this information an accurate representation of that needed to carry out the intended task?
3. **Reliability:** Would different people come to the same conclusions after examining these data?

In order to foster the technological and organizational capacities for information sharing, the National Institute of Justice made information sharing its top priority among state and local jurisdictions as well as internationally (Tomek, 2001). However, as the universe of collaborative participants expands, the difficulty in sharing information is related to different agency formats, protocols, standards,

and even how extensively the data is collected (Tomek).

Other overarching issues for the sharing of these intelligence data is the sheer amount of it as well as the expertise necessary for its proper distribution. "Sharing isn't bad, it's broken" ("Cyber intelligence tradecraft," 2013, p. 5). This was a point from the Carnegie Mellon Software Engineering Institute's *SEI Innovation Center Report: Cyber Intelligence Tradecraft Project Summary of Key Findings*. The report, known as the CITP, examined the cyber intelligence, methodologies, best practices, technologies, processes, and training from six government agencies and 20 organizations from industry and academia. It concluded that while some organizations excel at gathering and analyzing data from various sources, the sharing and dissemination of those data, lack the finesse and efficiency that are necessary for confronting the cyber conflicts that are prevalent in the world ("Cyber intelligence tradecraft, 2013").

According to the Carnegie Mellon report, government agencies that were profiled in the CITP were quite capable at sharing data internally. The agencies stated however, that access to data from external organizations was difficult and challenging. The arguments of classification and need-to-know restrictions on information sharing were no longer true, due to technology solutions available. Most cited that the organizational culture that was in place was the biggest hindrance. Organizations in industry and academia shared this cultural bias prevalent in government; they are reluctant to share "sensitive" indicators and intelligence data with competitors. Those who are able to overcome this bias, by sharing indicators of malicious activity, analytical reports and various data surrounding malware and suspect IP addresses, have enjoyed success in being able to stay ahead of the cyber threats ("Cyber intelligence tradecraft," 2013).

Unfortunately, no framework is in place that provides a common format for the importing of these data into the analytical structure of the organizations and agencies. It does not matter how these entities process their information internally, a common output format must be designed for importing into the

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analytical processes. Protocols are in place as an attempt at this standardized output; the National Information Exchange Model and its components, is one example (Fusion Center Guidelines, n.d.). There are a number of other options available to be explored, which would allow agencies to leverage existing resources.

Among these options would be the development of an effective Artificial Intelligence (AI) system to deal with the problems of extracting information from the massive amount of background data on both criminal and terrorist activities. Through a blend of learned pattern matching and relationship development on these indistinct and scant indicators of potential or actual threat activity (Steinberg, 2009), an AI solution can be crafted to adaptively generate attack hypotheses, analyze and process these hypotheses, as the program begins to understand the situation. The software's integration of the data from diverse database sources and "context-conditioned" reasoning will help agencies manage threat activity (Steinberg).

1.2. Different means of terror

This threat activity information being delivered by the fusion centers reflects the fact that terrorist groups and modern day criminal entities are beginning to cultivate alternative ways to interrupt or demolish critical infrastructures (Johnson, 2012).

Sometimes these plans generate patterns, but usually not. AI applications can be developed to address the common issues of searching through massive collections of unstructured data from unrelated or confidential data sources. These hypothesis development and examination techniques can create a solid foundation for new data mining approaches by law enforcement (Johnson).

The San Diego County Automated Regional Information System (ARJIS) is an example of a carefully crafted attempt at bridging the inter-jurisdictional data-sharing barriers.

Information from 71 state, local, and federal agencies in the two California counties that border Mexico, San Diego and Imperial counties, is compiled into one website that registered law enforcement agencies can access

ARJIS is updated every 24 hours with crime-incident data, most-wanted listings, and interactive maps. This secure network, known as ARJISNet, brings together data from approximately 11,000 police, court, and corrections officials who are registered on the system.

(ARJIS, 2007). ARJIS is updated every 24 hours with crime-incident data, most-wanted listings, and interactive maps. This secure network, known as ARJISNet, brings together data from approximately 11,000 police, court, and corrections officials who are registered on the system. This virtual private network protects its databases via firewalls and assigned passwords (ARJIS).

The secure network feeds over 6,000 workstations with 4,265 square miles of San Diego County. The number of daily transactions coming into the system number over 35,000. ARJIS provides all manner of tactical analysis, statistics, and crime analysis. The participating agencies share the collated information among all levels of operation, from chief to officers to technical staff (ARJIS, 2007).

ARJIS provides a number of elements directed at major public safety resources such as wireless access to photos, warrants, and other data helpful to the field officer. Mapping of crime and sex offender data, analysis of crime analysis tools, and other applications useful in solving crimes and identifying offenders, is provided as an enterprise-wide system. Due to its unique positioning in the community, the system is an information clearing house and distribution center for officer warning, information sharing, and the interchange, corroboration, and real-time uploading of public safety data (ARJIS, 2007).

The Pennsylvania Integrated Justice Network (JNET) is a network connecting all of the state's criminal justice organizations. Users of the system can submit a name to the JNET Web site, and it will query all of the connected databases and return the results viewable

on a web browser. Offender photos and images of any distinguishing marks are part of the database. In one case, a perpetrator was caught because a victim was able to describe a tattoo on the offender to police (Walsh, 2003).

Unlike, ARJIS, JNET does not have a public interface. While it is solely dedicated to law enforcement use, JNET runs on the public Internet using a digital encryption scheme of assigned digital certificates that are allotted to users of the system that encrypts their logon credentials and gives them access to appropriate sections of the network. This secure web portal arrangement allows access to over 38,000 criminal justice members throughout 67 counties in Pennsylvania as well as federal, state agencies, and municipal police departments (Pennsylvania, n.d.).

While the interconnection of disparate databases from various law enforcement entities is made possible by the new technologies, a phenomenon known as "linkage blindness" occurs, due to differences in data storage and collection techniques between the various agencies. At its core is the fact that there is a lack of critical communication links between various jurisdictions and the criminal justice system and the broad community (Grant & Terry, 2005). The variety of the various criminal justice disciplines and foundational responsibilities make this data-sharing problem even more complex (Tomek, 2001).

Two years after the establishment of San Diego County's ARJISNet network, a number of gas station robberies occurred in Los Angeles County. A group of men in Torrance, California, perpetrated them and while appearing to be a typical local

crime, they actually financed a larger scheme to attack military and Jewish facilities. This case sustains the fact that no longer are the lines between criminal and terrorist activities so clearly defined, and that fusion centers are vital in helping those agencies obtain a broad overview of the threats that they face (Torrance, n.d.). A major question is how could AI and the interconnectivity of the various databases, such as those developed by San Diego's ARJIS and Pennsylvania's JNET, be used to develop inferences from patterns of criminal activity and relationships, and aid in the pre-crime detection of the events in Torrance, California and those of 9/11. Patterns of money-flow to the 9/11 hijackers, aviation training, types of crimes in Torrance and their locations, could have allowed AI to create relationships between these activities and alerted authorities to investigate further.

2. Discussion of Findings

What would Artificial Intelligence's role be in the aggregation of critical threat data into actionable intelligence? How could Artificial Intelligence be used as an aid to intelligent policing? How could resource management leverage Artificial Intelligence for more effective deployment of resources?

The battle strategy for dealing with criminals and terrorists depends upon information. However, there is an inability for the various participants in the law enforcement and intelligence communities to share these data. The U.S. can't begin to analyze all of the data that it is collecting. There is now so much of it that AI is the only effective way to monitor, analyze and manage it.

In researching the means for sharing of information used to combat criminal and terrorist acts, it was found that government organizations did not have any trouble with information being shared internally between their various departments. Where they do have problems is receiving data from external organizations. While organizational cultural differences are most likely to blame, it is also shown that data collected does not exist in a common format that all participants can use.

The fusion centers were created to share data among the various agencies and organizations but they have generated so much data that the problem of sharing and analysis of the

data collected has been exacerbated. This has led to organizations that could benefit from the sharing of intelligence data, adopting an organizational culture that prohibits the sharing of intelligence information. It is too difficult to accurately share the intelligence, given the amount and incompatibilities of format. As a recent study conducted by Carnegie Mellon discovered, "Sharing isn't bad, it's broken" ("Cyber intelligence tradecraft," 2013, p. 5). The best performing organizations do not just consume data they have informal sharing arrangements with other organizations.

Simplifying the process of sharing data, while attempting to predict crime and terrorism, evaluation of the fusion center information by these organizations would benefit from an Artificial Intelligence application. Its ability to analyze the data returned and to use pattern matching, coupled with behavioral analysis, along with the identification of the connections of all events, allows AI to determine the likelihood of criminal activity in the communities from which the data was returned. In susceptible areas, burglaries will occur at the same houses because burglars there will know the vulnerabilities of that area. Gang violence is also clustered because a gang shooting will often produce revenge shootings intended to enhance the status of the gangs.

AI's ability to gather and parse information is totally dependent upon agencies and organizations that have an interest in responding to these criminal acts. These organizations can also provide valuable data for AI to collate and disseminate to the appropriate agencies. Hospitals in the area and emergency services, city public works agencies, federal law enforcement agencies, probation and parole agencies, bar and nightclub owners and managers, social service providers, and members of neighborhood groups, are all stakeholders that can provide and benefit from actionable intelligence related to crime and crime prediction that has been processed by Artificial Intelligence.

The timely sharing of information between various jurisdictional entities in disparate geographic areas is generally agreed to be the primary weapon against terrorist and criminal acts. At all government levels, the fusion centers are thought to be the most efficient way to share this information in not only a timely,

but cost effective way. Therefore, fusion centers are located in most states and generate an enormous amount of data used to coordinate counter-narcotics activities as well as the policing of illegal immigrants. The Department of Homeland Security deems fusion centers "all-crimes" centers ("Fusion centers: Turning," 2008).

However, the complications of working with data in incompatible formats can be eased by applying AI in the form of software entities known as intelligent agents. While compiling data on a target or individual, if data formats differ, the agents can reformat the data according to rules set forth for compatibility. Then, as the data is arranged into a dossier, the agent will interpret its findings and, as determined by its rules, act on those interpretations and alert to any conditions that might trigger the notifications.

AI will aggregate critical threat data into actionable intelligence by creating a common framework and format for these data to be effectively analyzed by both human investigators and learning machines. AI will overcome format inconsistencies and relieve the investigators of the burdensome tasks of decoding and reformatting the data before any effective analysis can begin.

Artificial Intelligence and its associated agents can act as information detectives for law enforcement. It is important to be aware that in order for information to become usable, it must be timely and meaningful. The agents must be able to constantly monitor information and determine if there is a better source or means of analysis for interpreting the intelligence received.

Pattern matching is key to creating actionable intelligence; otherwise, it is just a large amalgamation of data with no connections between elements. AI's ability to discern patterns of behavior and therefore predict future outcomes creates a real tool for finding a use for the data collected. Since finding a use for these data is the intent of data fusion, AI's ability to learn and pattern match allows it to fit right into this plan of creating actionable intelligence from the vast amounts of data collected.

The vast amount of data produced and available to government and law enforcement has led to the creation of the discipline of Intelligence-Led Policing.

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An AI program can be crafted to adaptively generate attack hypotheses, analyze, and process these hypotheses as the program begins to understand the situation. The software's integration of the data from diverse database sources and "context-conditioned" reasoning will help agencies manage this threat activity through machine learning.

Machine-learning algorithms are sets of adaptive instructions telling the computers that are parsing the intelligence how to carry out their work. The adaptation and adjustments by the associated data instructions provide the best processes for allowing Intelligence-Led Policing to profile criminals and terrorists. The process of data mining involves the use of various statistical and pattern-recognition technologies to take raw data and determine relationships and dependencies between the various elements of that data.

An AI tool known as the Peer-to-Peer Inference System (P2PIS) can organize data for law enforcement from these elements. This solution would require the use of autonomous software agents, placed within the related network and data base systems, called peers.

Each of the peers would use a knowledge base related to the database application to which it is monitoring. Any peers having similar interests could establish links, known as mappings, between their individual knowledge bases.

These mappings set up inferences and relationships between the various databases that would allow them to create a dialogue that would be helpful in developing a "semantic" communication between peers ("Artificial intelligence and," 2008). When new data appears in the database, the "semantically-mapped" peers would be tasked to check their knowledge bases. After a number of queries over time, they would be able to find related consequences, conduct diagnoses of these inferences, and warehouse the related data. These data could be stored for knowledge examination and "learning" in order to alert authorities of possible anomalies in behavior, a critical component in Intelligence-Led Policing.

Had the patterns of four young Arabic men taking flying lessons for flying large airplanes but not interested in learning

how to land them been examined more closely for statistical and pattern matching, the attacks of September 11 might never have happened. Sometimes, these relationships and patterns are previously unknown and are identified solely through the use of data mining. Intelligent data mining with AI and intelligent agents can do a better job of predicting criminal or terrorist acts by assessing risk. AI, while enabling intelligent policing techniques to analyze observed behavior and model it, can assist the analyst in determining whether that behavior will happen again. This is performed in exactly the same way retailers are identifying consumer-purchasing habits with behavioral profiling.

Behavioral profiling can involve criminal network analysis, which often requires the ability to integrate information from various sources, and discover patterns emerging about organization, processes, and how information flows within a criminal or terrorist organization (Xu & Chen, 2005). This analysis can become very expensive and would require funds to be dedicated solely for the purchase of AI software as well as manpower to interpret the output.

In order to disrupt or predict operation patterns of these networks, data retrieved via the use of sophisticated AI pattern matching techniques need to be reliable and are essential to the success of any investigation. However, as is usually the case, the intelligence and law enforcement agencies are faced with a huge amount of data. Manual interpretation of these data is difficult, but AI could be used to assist in the criminal network analysis. The manual data mining techniques used in other data acquisitions are more prone to difficulties when dealing with criminal networks due to:

- **Incompleteness** – criminal and terrorist networks by their very nature operate covertly (Krebs, 2001). Criminals rarely interact with each other in order to minimize attention from police. Any interactions that exist are kept hidden behind their illicit activities. Any data about the criminals and their networks are missing nodes and links, and present incomplete patterns and associations that are troublesome, if parsed manually (Sparrow, 1991).
- **Incorrectness** – data regarding the suspects' identities, physical characteristics, and addresses are

usually incorrect due to faulty data entry or deception by criminals who usually lie about their identities when apprehended.

- **Inconsistency** – when a criminal has multiple contacts with police his information will be entered into the criminal databases multiple times. These records are neither compatible nor consistent and would make the single criminal appear to have multiple identities and appear to be different individuals.
- Another reason for the use of AI to help with proper analysis of these data for the law enforcement community is that an investigator must deal with the inherent problems in using multiple databases. AI can help with:

- **Data transformation** – AI would present the data in a specific format that would be conducive to network analysis, showing network members as nodes, and their associations or interactions as links. When given the appropriate rules for the associations and pattern recognition, AI would be able to parse the raw data and visualize these relationships for the investigator.
- **Fuzzy boundaries** – the various terrorist and criminal networks are likely to be ambiguous. An analyst would have a difficult time trying to place subjects in one network or another (Sparrow, 1991). AI would be able to ingest a larger number of datasets and categorize accordingly, greatly easing the burden of the analyst.
- **Network dynamics** – criminal networks are subject to change all of the time and are not static (Sparrow). AI will be a critical tool for the analyst to capture the dynamics of criminal networks.

Social Network Analysis (SNA) utilizing AI will be the ideal combination of critical analysis tools. SNA is specifically designed to recognize any patterns of behavior and interaction between social actors in social networks (Wasserman & Faust, 1994).

Modernize these techniques with the self-correcting and machine-learning techniques presented by AI and intelligent agents to reveal the various structures and interactions in these terrorist and criminal networks, and the dismantling of these terrorist and criminal networks will be made easier.

AI's potential for pattern matching and inference of data relationships would make it ideal for integrating the identification and analysis of continuing problems such as auto theft or drug crimes, and would assist in studying and evaluating relevant responses and procedures for dealing with these crimes.

The leveraging of Behavioral Recognition Technology by intelligence-led police organizations will be made easier by coupling this technology with machine-learning techniques that can provide actionable intelligence in real-time by alerting authorities to camera-observed anomalous behavior. It is relatively simple to program a computer to detect movement in a video image. It is just as simple to apply a "rule" and have the computer alert when that movement violates the conditions of that rule. The slightest variation in the environment in which the video is monitoring can cause miscalculations and false alerts which can provide frustrations to those monitoring the alerts (BRS Labs, 2012). Since surveillance video plays an important part in the prediction of crime, AI will be needed for interpretation and analysis in order to lessen the chances of miscalculations and false positive or false negative alerts.

The data mining evolution will also be enhanced through AI by the creation of algorithms that allow software to learn, grow, and improve independently. Neural networks have also advanced to where they are accepted tools for classifying, predicting, and profiling. The successful development of intelligent agents that can move out into networks and the Internet and look for whatever information they were programmed to retrieve, are the norm. All of these elements, when combined, allow AI to develop theories that can point to everything from fraudulent credit card transactions, to identifying tanks on the move from satellite imagery. These applications can learn, grow, and adapt to creating actionable intelligence that can even be used to thwart potential criminal activity (Mena, 2003).

From identifying which of the millions of people who cross United States borders each day is a smuggler, to predicting that a merchant on eBay is about to abandon successful bidders and skip out with hundreds of thousands of dollars, AI can bring a new dimension to law enforcement's ability to predict and prevent crime. Statistical Criminal Analysis, utilizing AI can take prior criminal and terrorist activities and cross-reference the variables and baseline data characteristics into relational connections for change and relevant dependencies ("Artificial intelligence and inference," 2008). This is the intent of AI being applied to the data and interpolating any relationships between those data. Once that relationship is defined and codified, it will be in a better format for disseminating to law enforcement and intelligence agencies.

AI's potential for pattern matching and inference of data relationships would make it ideal for integrating the identification and analysis of continuing problems such as auto theft or drug crimes, and would assist in studying and evaluating relevant responses and procedures for dealing with these crimes.

Before the era of Intelligence-Led Policing, the entire policing strategy was based on random patrolling of areas, responding to an incident as rapidly as possible, and investigating why the crime was committed after the fact. Managers tasked with making the efficient use of police resources were hard-pressed to keep up with the ever-changing face of crime in their communities (Ratcliffe, 2008). A reactionary means of determining how patrols were to be set up and maintained was not the best way to allocate manpower and equipment.

AI, with its ability to predict patterns and identify likely areas of criminal activity, provides a more economical alternative for resource management, crime prevention. Police departments are always facing budget cuts and while outsourcing is not the solution, predictive policing can bring resource management to a new level of efficiency and optimization. It is the proper use of AI and predictive modeling that will be beneficial to the departments and to the community.

Companies like Wal-Mart have long embraced the ability to predict or anticipate future demand. For example, when a large weather event is expected, Wal-Mart may redirect its supply chain to distribute duct tape, bottled water, and Pop-Tarts to the affected area before the storm hits. While it is understandable that duct tape and bottled water will be needed in the time of disaster, Pop-Tarts may seem like an odd choice. Wal-Mart has years of experience in dealing with large weather events and has found that there is an increase in sales of Pop-Tarts, strawberry Pop-Tarts to be exact (Borne 2006). The reasons are that Pop-Tarts can be eaten cold; they are tasty; kids like them, etc. This is the discovery part of predictive analysis, which can be a powerful ally in policing and resource management.

The disciplines of computer science, law enforcement, intelligence, and health have long had technical issues with searching through large amounts of data in the form of unstructured text and databases ("Artificial intelligence and," 2008). All of these techniques rely on crime pattern identification techniques for their planning. Research has shown that crimes usually occur in populous areas. A completely random pattern of crimes rarely occurs. The application of AI techniques would allow the usage of predictive analysis to be integrated with point randomization processes, in order to better understand the influences of these processes on crime. An AI algorithm could be developed to analyze a seemingly random pattern of data and possibly reveal the underlying processes for crimes, while pulling these point patterns to the top for additional study, therefore allowing resources to be allocated accordingly, thus making fusion centers viable.

continued on page 22

3. Future Research and Recommendations

Fusion centers have been criticized for excess spending and not performing as intended ("Federal support for," 2012). Despite criticism in Congress, it doesn't look like fusion centers are going to be dismantled. A Department of Homeland Security white paper on budget recommendations for 2013 placed a strong emphasis on maintaining and growing fusion centers ("FY 2013 budget," 2012).

It is recommended that a budget item for this maintenance and growth be included for the development of Artificial Intelligence software and procedures for the analysis of data collected by these centers in the Federal Budget. Money that is granted to active fusion centers is often spent on training, improved communications systems and various items associated with any incidents that might result in mass casualties (Hodai, 2013). The ability to determine patterns of behavior in order to predict these events would be enhanced with the implementation of AI and monies intended for mass casualty reaction could eventually be redirected to other pursuits.

Not only will budgets need to account for the development or purchase of AI software but training as well. Training for fusion center personnel is usually conducted to instruct in the rules concerning classified information as well as the type of information these personnel will expect to receive during fusion center briefings ("Considerations for fusion," 2010). A new level of expertise will be required due to the fact that while the AI software will do a majority of the "heavy lifting" to extract the appropriate information, it will take a knowledgeable team of operators to examine the output from these programs to determine if the projected assumptions are reasonable. It would be foolhardy to blindly trust the output from the AI programs without a formal program of checks and balances.

The personnel at the closest layer of the intelligent agents being used for data collection and classification will need to be conversant in the techniques being used by AI and the agents. Knowing what is being done "under the hood" will help to monitor the output of the data that the agents are producing. Then the data can be passed on to the subscribing

agencies or other investigators, once the formatting of the data is arranged in a compatible format for analysis.

The fusion centers operate under a mandate that is broad and ambiguous. The task before them is to fuse data to produce "intelligence" that can be used to prevent terrorist acts. The fact that they are also expected to respond to all crimes or hazards amounts to an invitation for personnel at the fusion centers to engage in almost any surveillance that they think is necessary to accomplish the task. This amount of flexibility has a perceived benefit to local police departments to use the Department of Homeland Security and other assets for whatever needs the departments deem as being necessary to address the tasks at hand, for their particular jurisdiction. However, it is suggested that people at some fusion centers are exploiting this leeway granted to them to engage in racial profiling, political profiling, illegal data mining, and illegal data collection (Monahan and Palmer, 2009).

Given the myriad amount of data sources and options available to the fusion centers, it is possible that "mission creep" or "function creep" develops, whereby analysts exceed the policies and laws that govern their activities (Monahan & Palmer, 2009). The implementation of AI will allow this collection to proceed at a much faster and broader pace. It is recommended that a more detailed study of the effects and possible incursions into the privacy of individuals due to the increased efficiency of AI in the collection and analysis of data, be conducted.

Assuming that the intelligence gathered was better and presented a more reliable means of predicting crime or terrorist events, what should be done with this information? The prospects of incarceration or invasion under the predictive assumptions that AI can create, seem excessively harsh, considering the alternatives available, such as surveillance or containment. The laws must be modified for the new concerns that AI will generate.

The strategies that police departments use over the years are constantly evolving. The potential use of Artificial Intelligence to enhance the current tactic of Intelligence-Led Policing (ILP), while still in its infancy, can become an effective tool for police investigations. In order for AI techniques to be crafted into the everyday operations for crime

fighting, an examination of the attitudes and opinions of police managers be conducted to identify any hurdles or resistance to the fusion of AI with ILP.

Based on the findings of that research, police administrators would be able to anticipate any problems and understand the mind-set of supervisors. Historically, police resources and responses have always come from goal shifts. In London, for example, Sir Robert Peel first organized the London Metropolitan Police to focus on crime prevention, instead of response (Johnson, 1988). Technological advances, such as telephones and cars, reduced response time and expanded the areas an officer could cover during patrol (Philips, 2012). As with these advances, AI can help to shift the goals of Intelligence-Led Policing into a pre-crime detection phase.

The ability to have AI identify covert intent of individuals who may be contemplating hostile activities would improve the counter-insurgency and peacekeeping operations.

These persons are usually deeply embedded in the "clutter" of neutral, friendly individuals. Whether this identification is accomplished through facial recognition technologies or pre-crime analysis of acquired data, studies should be conducted to reduce false-negative and false-positive rates. By determining covert adversarial or hostile intent in advance, the resources needed for operations, planning, training, and simulations can be redirected from broad based approaches to more defined, targeted operations based on AI's predictions of activity.

Obviously, additional funding for testing the use of AI for pre-crime detection, if implemented, will be needed. The most obvious source of this funding will be the Federal government. Advancing Intelligence-Led Policing will require research and development programs for AI and should be promoted by programs from U.S. Department of Defense, Department of Homeland Security, Intelligence Advanced Research Projects Activity and other Federal research and development (R&D) programs. Specifically:

- The Federal government should fund R&D of an AI prototype system for the parsing of data from regional fusion centers and a working model for the remote detection of covert adversarial intent.

- The Federal government should continue to provide extensive support for academic and industrial development of AI's ability to connect disparate systems of information necessary for the detection of remote adversarial intent. Recognizing this intent is a crucial central requirement for the success of AI in predictive crime analysis.

4. Conclusion

With the implementation of facial recognition technology and the development of a system that can analyze an individual's "intent" by measuring blood pressure, breathing rate, or body temperature, without making physical contact, it is imperative

that the general public be continuously surveyed to gather attitudes on the encroachment of 4th Amendment Rights by these technologies. If an individual goes out in public and their image is captured by AI facial recognition technology, has that person, by default, given up all 4th Amendment privacy protection? This activity must be studied and conclusions drawn regarding the legal ramifications of this type of surveillance.

If the police community and the government were to move into a preemptive criminal investigation or military action posture, the data returned by AI will need to be tested in order to achieve an extremely high level of accuracy. The potential for

AI's ability to streamline the jobs of law enforcement and intelligence communities is immense, but cost will be a factor. Homeland Security estimates that the money that is being spent on AI systems used for determining observable hostile intent in individuals will quadruple in the next three years (Pierson, 2012).

The amount of money involved makes this a multi-billion dollar industry. It is only reasonable that a system of checks and balances be instituted to prevent the questioning or search of an individual because a computer system thinks that the individual looks suspicious. The system can work if properly designed and vetted. The investment, while high, is worth the price.

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Hitachi built an AI security system that follows you through a crowd

April 19, 2017

MAX TOOMEY

A new AI security system for airports can pick out every little detail about you. And then it follows you.

Hitachi's new AI system can classify people based on more than a hundred characteristics, including your gender, what you're wearing, what you're carrying, how old you are and how you're walking.

It's being developed to help make you safer, says Hitachi.

"In Japan, the demand for such technology is increasing because of the Tokyo 2020 Olympics," said senior researcher Tomokazu Murakami, who demonstrated the software, "but for us, we're developing it in a way so that it can

be utilized in many different places, such as train stations, stadiums, and even shopping malls."

The software can be used to flag and monitor suspicious behavior, say, or help find missing children.

The software can be instructed to track people with certain characteristics, but it can also find people in a crowd.

Privacy advocates see a couple of problems with such software. It erodes your right to privacy in a public space, says Privacy International's policy officer, Frederike Kaltheuner. And, importantly, it opens the door to profiling, because even though it might appear to be a neutral

machine, someone has to tell it what to look for.

"The way these systems are programmed," Kaltheuner said, "there's no way for them to be neutral because the suspicious behavior is not a scientific fact. It's something you have to define when you build this system." And that can lead to problems.

"You can employ and develop these systems with the best intentions in mind, and then they're used by people who want to identify alcoholics, or who want to identify people of a certain race."

The software is expected to be rolled out for corporate customers within two years.



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This crime-solving AI was originally developed to help astronauts-in-training



January 22, 2018

ROSIE MCCALL

Your local police force's newest recruit could be more machine than human. Security departments in the UK and Belgium are, right now, testing an artificial intelligence (AI) program that will take on the arduous task of sifting through potential evidence (a process that is usually completed manually) to help solve crimes. Rather bizarrely, VALCRI (Visual Analytics for Sense-Making in Criminal Intelligence) was built from software originally designed to prepare trainee-astronauts for stints in space.

Early versions of the system were developed 15 years ago by a company called Space Applications Services and its purpose was to train junior astronauts at the European Space Agency (ESA) Columbus research laboratory (a research facility attached to the International Space Station). It does this by responding to questions such as "What is this?" and "Where is this?".

Later this year, a more advanced version of the technology – an intelligent mobile crew assistant – will be tested by Alexander Gerst, the next ESA astronaut to travel to space.

But programmers have also discovered a new use for the tech – security. Recent upgrades have allowed it to take on police work.

The tool combines machine-learning technology with visual analytics to allow for real-time analytic data interaction. This means VALCRI is able to surf through thousands of hours of surveillance camera videos and examine millions of police records to dig up clues and find connections that can help with the case, sparing crime analysts the backbreaking task of having to do it all manually. It may also help to speed along investigations and predict future crimes by drawing attention to information and connections humans miss.

In 2017, the company announced that the AI program was undergoing a trial funded by the European Union and taking place in the West Midlands, UK. It involves analyzing three years' worth of real but anonymized crime data, which amounts to roughly 6.5 million records in total. The next stage will be to use non-anonymized, new data in real-time i.e. when the crimes are taking place.

Similar tests are also taking place in Antwerp, Belgium, and, according to Space Daily, the software could become a commercial product by the middle of this year.

This is not the first time AI has been put to the task of crime solving. Last year, a supercomputer was programmed to find out the identity of the elusive Zodiac Killer – and took up poetry writing as a side hobby.



Bella boge-nielsen

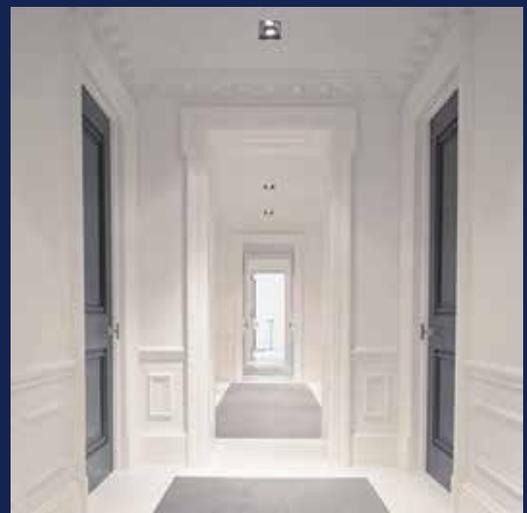
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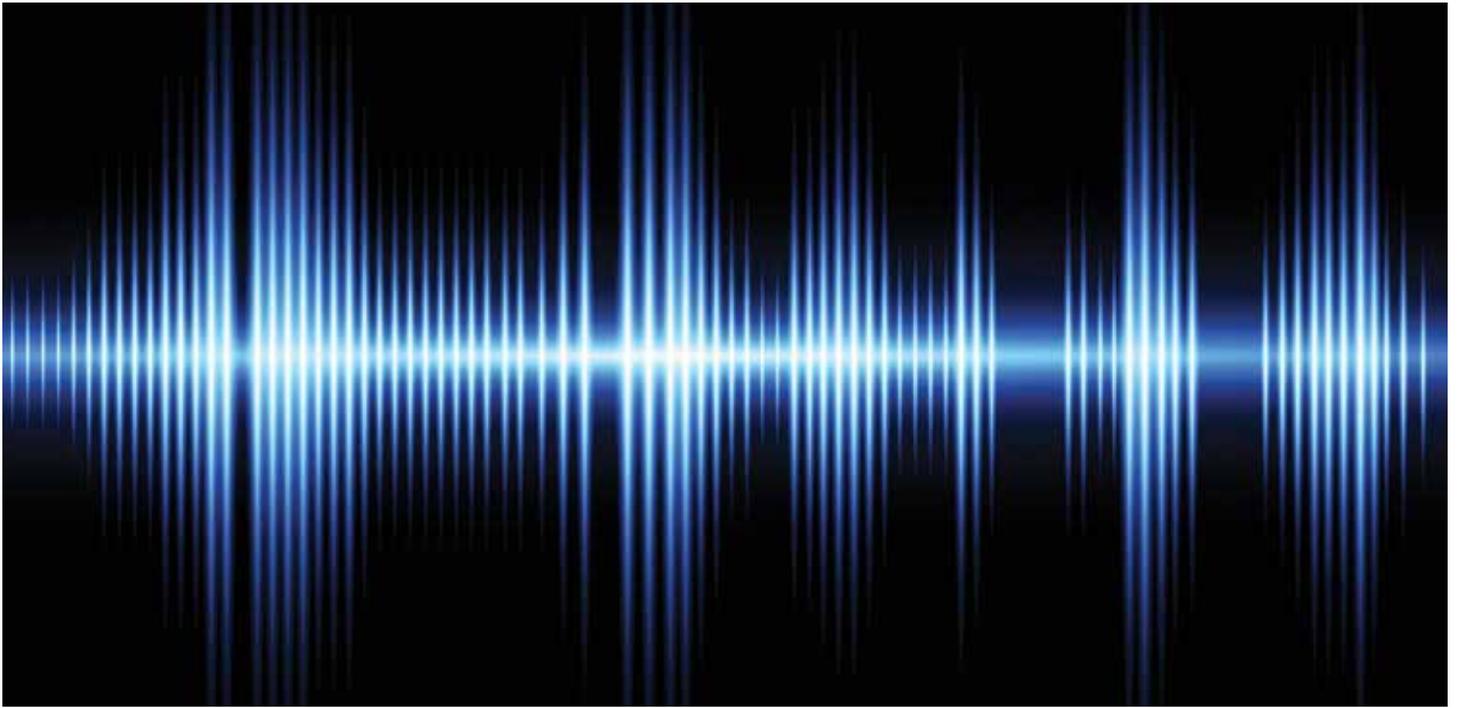


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Eerie tech promises to copy anyone's voice from just one minute of audio

ABHIMANYU GHOSHAL

I'm not sure how I feel about the upcoming launch of Montreal-based Lyrebird's new service. The company says its API will let you synthesize speech in anyone's voice from just a minute-long recording – which means you could, for instance, generate a clip of President Trump declaring war on Canada.

Lyrebird has posted some audio examples that sound pretty convincing. The company says that it doesn't require the speaker to say the words that you'll use the voice to speak in the audio you generate, and it'll also be able to create different intonations.

If any of this sounds familiar, it might be because you're thinking of Adobe's demo of its similar tech last November. But while Adobe's Project VoCo requires 20 minutes of audio and appears to use system resources for speech synthesis, Lyrebird only needs a minute-long recording and says it's close to launching

its cloud-based API to process audio and spit out results.

As I wrote when we covered Project VoCo last year, it's likely that such software will lead to the creation and distribution of plenty of misleading information that people might believe to be genuine.

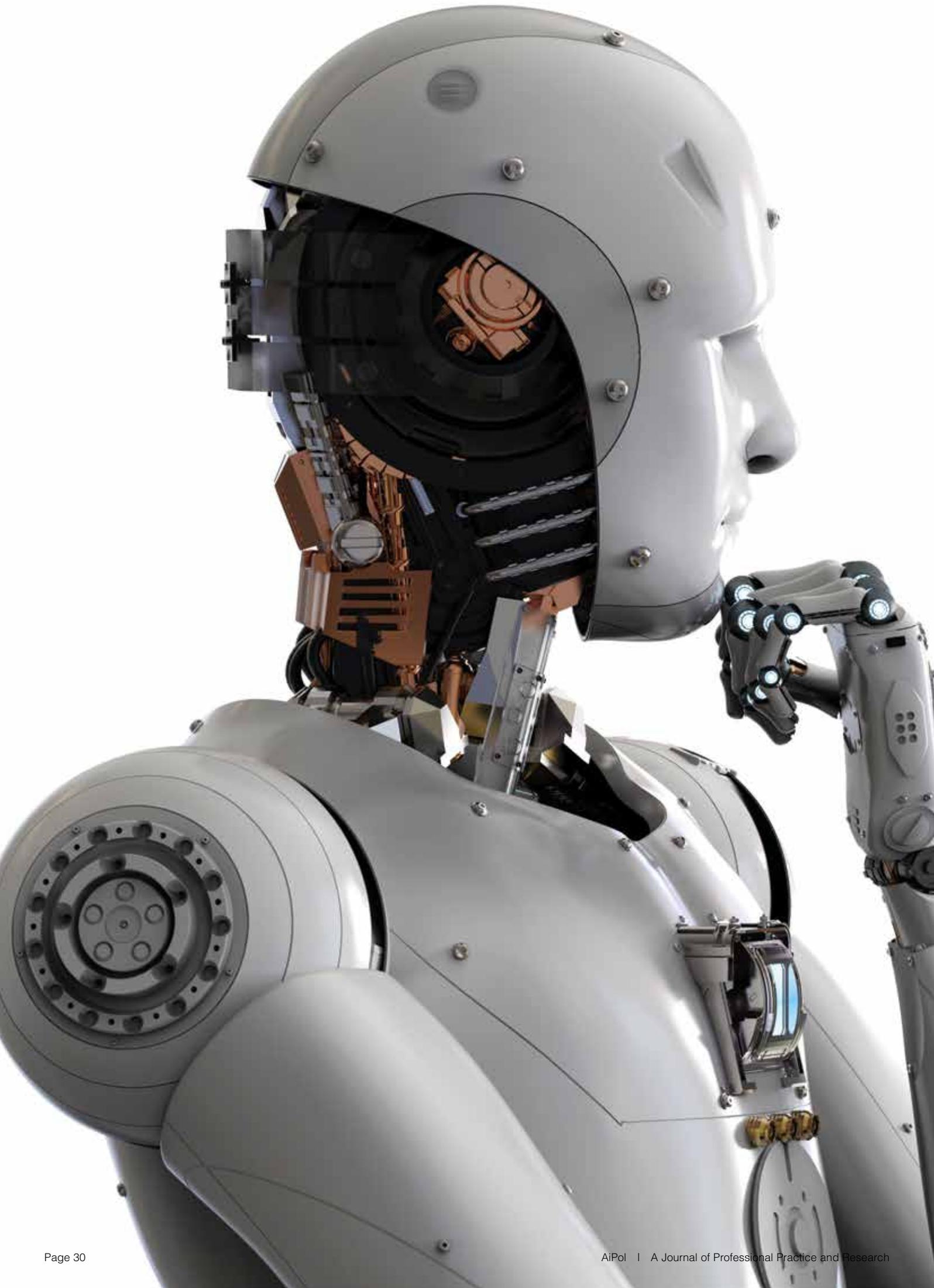
On its Ethics page, Lyrebird says that its technology "questions the validity of such evidence as it allows to easily manipulate audio recordings." It added:

By releasing our technology publicly and making it available to anyone, we want to ensure that there will be no such risks. We hope that everyone will soon be aware that such technology exists and that copying the voice of someone else is possible. More generally, we want to raise attention about the lack of evidence that audio recordings may represent in the near future.

Lyrebird might be on to something there: the widespread availability of image manipulation tools has led to people questioning the veracity of photographs that are circulated in the press and on the web, as well as the integrity of their sources. But there's still a huge risk of people falling prey to scams and misinformation through tampered audio.

And we're not just talking about copying the voices of world leaders: people could be duped into handing over sensitive data when they think they're speaking with a significant other or a family member, and company employees could find themselves following counter-productive orders from someone on the phone who happens to sound an awful lot like their boss.

We've contacted Lyrebird to learn more and will update this post if there's a response.



Of, for, and by the people: the legal lacuna of synthetic persons

Published online: September 8, 2017

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Abraham Lincoln, Gettysburg Address, Nov. 13, 1863

("[W]e here highly resolve ... that government of the people, by the people, for the people shall not perish from the earth.").

Abstract

Conferring legal personhood on purely synthetic entities is a very real legal possibility, one under consideration presently by the European Union. We show here that such legislative action would be morally unnecessary and legally troublesome. While AI legal personhood may have some emotional or economic appeal, so do many superficially desirable hazards against which the law protects us. We review the utility and history of legal fictions of personhood, discussing salient precedents where such fictions resulted in abuse or incoherence. We conclude that difficulties in holding "electronic persons" accountable when they violate the rights of others outweigh the highly precarious moral interests that AI legal personhood might protect.

Keywords

Legal personality ▪ International organisations ▪ Artificial intelligence ▪ Robots ▪ Legal agency ▪ Moral subject ▪ Ethics

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1 Introduction

Fiction abounds with artificial human-like characters: robots, clones, and bioengineered humanoids. But fiction dwells on artists' conceptions of the human condition, and the contexts in which that condition might or might not be altered. Human-like artefacts are no longer fiction, and humanity is now confronted by the very real legal challenge of a supranational entity considering whether to attribute legal personality to purely synthetic intelligent artefacts. The European Parliament has asked the European Commission to write legislation addressing the forthcoming challenges of artificial intelligence (AI)—a sensible and timely suggestion. Here we address only one aspect of that proposal the recommendation that the legislature should consider:

“creating a specific legal status for robots in the long run, so that at least the most sophisticated autonomous robots could be established as having the status of electronic persons responsible for making good any damage they may cause, and possibly applying electronic personality to cases where robots make autonomous decisions or otherwise interact with third parties independently.”

The language concerning “electronic persons” indicates a clear intent to confer on some intelligent artefacts legal-person status, such as is also enjoyed by most humans.

In this article, we ask whether a purely synthetic entity could and should be made a legal person. Drawing on the legal and philosophical framework used to evaluate the legal personhood of other non-human entities like corporations, we argue that the case for electronic personhood is weak. Though this article begins with philosophical premises, its orientation is ultimately pragmatic. A legal system by the people exists ultimately to protect the interests of the people. That is to say, the people currently recognized as such. In the absence of some compelling moral necessity, we should consider the likely costs and benefits of any legal change

The language concerning “electronic persons” indicates a clear intent to confer on some intelligent artefacts legal-person status, such as is also enjoyed by most humans.

for the people. Welcoming AI to the class of legal persons would be a change. Our purpose here is to identify some costs that that choice would present.

We work with a historical concept of legal personhood, as set out in the excellent review of the issue by Solaiman (2017). To summarise Solaiman very briefly, legal personhood extends to the set of entities in any lawfully-regulated society that have rights and obligations under the law. The basic provisions for a legal person are:

1. that it is able to know and execute its rights as a legal agent, and
2. that it is subject to legal sanctions ordinarily applied to humans.

Historically, only a relatively small subset of humans' would have counted as legal persons. Legal personhood has been extended not only to humans, but also to corporations and (in some countries) idols and environmental objects. Creating a legal status of electronic personhood for purely synthetic intelligent entities would require that such entities could fruitfully satisfy Solaiman's second criterion. We argue here that it is far from clear that artefacts could or should be designed so as to acquire this status.

We begin our article by demonstrating the timeliness and immediacy of our concern that robots might be made legal persons. Proposals for creating synthetic personhood are already on the table, and there are sufficient legal tools in place to implement them. We advise caution and reflection on the problems that have arisen in the past with novel legal persons. While not always a zero-sum game, sometimes extending the class of legal persons can

come at the expense of the interests of those already within it. In the past, creating new legal persons has sometimes lead to asymmetries and corruptions such as entities that are accountable but unfunded, or fully-financed but unaccountable. Ultimately this means weakening the legal protections for humans vis-a-vis synthetic persons. Next we consider whether there are moral benefits to offset these risks or costs, such as achieving necessary moral objectives. We suggest that there is no moral obligation to recognize the legal personhood of AI. We recommend against the extension of legal personhood to robots, because the costs are too great and the moral gains too few.

2 Why concern ourselves with legal personality and AI now?

Academics have written for some years about the possibility of attributing legal personality to robots,² e.g. Asaro (2007); Koops et al. (2010) and Solaiman (2017). So the idea is not new. It gained considerable currency, however, after the Committee on Legal affairs of the European Parliament on 20 January 2015 established a Working Group for legal questions related to the development of Robotics and Artificial Intelligence. On 27 January 2017, the Committee put forward a Motion for a European Parliament Resolution in respect of robotics and artificial intelligence. On 16 February 2017, this Motion was adopted as the Civil Law Rules on Robotics.

Press reports give the impression that the Motion contains “comprehensive rules for how humans will interact with artificial intelligence and robots” (Wakefield 2017;

¹ In this article, *human* refers exclusively to members of the species *Homo sapiens*. Entities holding the class of legal rights and obligations we are considering here are *legal persons*. We use *robot*, *synthetic person*, and *AI* interchangeably.

² Most authors focus on robots rather than general purpose artificial intelligence (AI), presumably because robots are easier to identify with or feature more sympathetically in fiction. Here we take *intelligence* to be a process for doing the right thing at the right time, where what is ‘right’ depends on context; and a *robot* to be an artefact that perceives and acts in the analogue, physical world, in contrast to software that operates only in the context of a digital artefact.

Sulmont 2017). It does not. There are no legally binding decisions, and the proposals it makes are not in the form of rules, much less comprehensive ones. As a recommendatory text, the Motion identifies lines for future development, for example to create a registry of “smart robots,” to use the United Nations to set regulatory standards, to allocate public money to study the “social and ethical challenges” of advanced robotics, and so on. Of particular concern here, the Motion also suggested that European law might someday attribute legal personality to robots.

The Civil Law Rules are cautious and non-committal on the question of whether robots should be legal persons. Nevertheless, calling on the European Commission to consider the place of robotics in the European legal order gives the question unprecedented stature. Paragraph AB, in the introductory recitals of the Motion, says as follows:

“[T]he more autonomous robots are, the less they can be considered simple tools in the hands of other actors (such as the manufacturer, the owner, the user, etc.); ...this, in turn, questions whether the ordinary rules on liability are insufficient or whether it calls for new principles and rules to provide clarity on the legal liability of various actors concerning responsibility for the acts and omissions of robots...”³

The paragraph goes on to say:

“[U]ltimately, the autonomy of robots raises the question of their nature in the light of the existing legal categories or whether a new category should be created, with its own specific features and implications.”⁴

As adopted, these recitals do not prescribe a particular future status for “autonomous robots.” They are without prejudice to whether European law should attribute legal personality to them. Nevertheless, to identify as “fundamental” the question “whether robots should possess a legal status” strongly implies that the door is open to that innovation.

As part of a list of “general principles concerning the development of robotics and artificial intelligence for civil use,”

the Motion draws further attention to the possibility of attributing legal personality to robots. The Motion in particular calls on the European Commission “when carrying out an impact assessment of its future legislative instrument [on robots], to explore, analyse and consider the implications of all possible legal solutions.” In Paragraph 59, it includes giving robots “the status of electronic persons” among “possible legal solutions.”

Again, the Motion is not a statement of law-in-force. Nor does the Motion espouse a particular solution. It does, however, call on the European Commission to “explore” the attribution of legal personality to robots as a possible solution. Invoking the expressions “electronic persons” and “electronic personality,” it gives the idea a higher profile than ever before. The idea of legal personality and AI accordingly merits particular scrutiny at this time.

3 Legal persons: fictive, divisible, and not necessarily accountable

Before we can talk sensibly about legal personality for robots, we need to know what the expression “legal personality” means in general. *Legal personality* is a term of art in legal scholarship and practice. Jurists in multiple countries have set out definitions of it. This one, from the *Yale Law Journal* in 1928, is serviceable: “To be a legal person is to be the subject of rights and duties. To confer legal rights or to impose legal duties, therefore, is to confer legal personality...” (Smith 1928, p. 283). This definition is congruent with Solaiman’s characterization of legal personhood, discussed above.

Three observations about legal personality, so defined, are pertinent to the question of a possible electronic legal personality. First, legal personality is an artifice. When we say that an actor has legal personality, we mean that a legal system addresses its rules to the actor, both to give the actor rights and to subject it to obligations. Legal personality is not necessarily correlated with a metaphysical or ethical notion of personhood. While we should want our legal system to bear the metaphysical

and ethical concepts in mind, at different times legal systems have conferred legal personhood on much less and much more than the set of metaphysical or ethical persons. Legal personality results from a legal system’s decision to recognize that a particular entity has it. We may thus think of legal personality as a kind of fictional status, which the law may confer when doing so suits its ends.

Second, legal personality is an aggregate of legal rights and obligations, and thus it is divisible. Legal people need not possess all the same rights and obligations, even within the same system. A legal system might treat a given actor as a legal person in respect of some rights and some obligations but not in respect of others. It may even be helpful to think of legal personhood as a scalar concept, so that an entity can be more or less of a legal person as it possesses more or fewer rights and obligations.

Third, the legal personality of an actor, even if it entails that the actor has extensive rights and obligations, does not necessarily entail the actor’s effective engagement with the legal system. Though the actor may be the beneficiary of certain rules that give it rights, or the addressee of others that impose obligations on it, this does not in itself tell us what opportunities the legal system provides to that actor to take advantage of the rules or to other actors to hold it to account for breaches. That is to say, the rights and obligations that a legal person may have as a matter of law may not match those it has as a matter of fact.

We now consider in detail how each of these observations about legal personality bears on the possibility of extending legal personhood to robots.

3.1 Legal personality is a fiction of a given legal system

An entity’s inherent characteristics do not determine whether it is a legal person. It is true that legal systems are less likely to confer legal personality on inanimate objects, and more likely to confer it on entities that are people in the ethical

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³ The original language in the Final Motion, Paragraph S, read as follows: “[T]he more autonomous robots are, the less they can be considered simple tools in the hands of other actors (such as the manufacturer, the owner, the user, etc.); ...this, in turn, makes the ordinary rules on liability insufficient and calls for new rules which focus on how a machine can be held—partly or entirely—responsible for its acts or omissions; ...as a consequence, it becomes more and more urgent to address *the fundamental question of whether robots should possess a legal status*” (emphasis added).

⁴ The original language in the Final Motion, Paragraph T, read as follows: “[U]ltimately, robots’ autonomy raises the question of their nature in the light of the existing legal categories—of whether they should be regarded as natural persons, legal persons, animals or objects—or whether a new category should be created, with its own specific features and implications as regards the attribution of rights and duties, including liability for damage.”

and metaphysical sense. This may be because most legal systems wish to recognize and give effect to the rights and obligations that true people possess. But this rough generalization can be misleading. To determine whether an entity is a legal person, one must look to the approach a given legal system takes toward it.

Because of the rough generalization that legal people are in fact people, that the legal rights and obligations correspond to real rights and obligations, it is natural to think of legal personality as a fiction pretending to be something real. When a legal system confers legal rights and obligations on an entity, it has determined to treat that entity as though it were a person in fact. It is a kind of pretense in which legal systems can decide to engage, regardless of whether an entity really is a person (See examples in Solaiman 2017, pp. 3–4). Calling legal personality “a fiction” does not mean that it lacks real effects. To the contrary, the purpose of conferring legal personality on an actor is to enable that actor to have certain effects in, and to be affected in certain ways by, the legal system.

Every legal system must decide to which entities it will confer legal personhood. Legal systems should make this decision, like any other, with their ultimate objectives in mind. The most basic question for a legal system with respect to legal personhood is whether conferring legal personhood on a given entity advances or hinders those objectives. Those objectives may (and, in many cases *should*) be served by giving legal recognition to the rights and obligations of entities that really are people. In many cases, though, the objectives will not track these metaphysical and ethical truths. Sometimes legal personhood may be denied to real people in order to serve odious ends, like perpetuating privileges for some smaller group of people. Other times, a legal system may grant legal personhood to entities that are not really people because conferring rights upon

the entity will protect it or because subjecting the entity to obligations will protect those around it.

In this regard, the discourse and practice of recognizing legal personhood fits the kind of structure that philosophers call *fictionalism*. A domain of discourse is fictionalist if it seeks to represent something other than the literal truth (Eklund 2011). Participants in a fictionalist discourse engage in a sort of pretense (whether wittingly or not) by assuming a stance according to which things said in the discourse, though literally false, refer to real entities and describe real properties of these. Discourse about fictional narratives is one easy example. When someone asks whether Daenerys Targaryen has two or three dragons, they are not asking after some fact in the world. Rather, they mean to ask whether the statement is true within the fiction *Game of Thrones*. Many modern philosophers think fictionalism offers the best account of some familiar domains of discourse, from math (e.g. Field 1989), to morality (e.g. Joyce 2001), to truth (e.g. Burgess and Burgess 2011). When they argue that these domains of discourse are fictionalist, philosophers take on the burden also of saying why we would go to the effort of earnestly saying things that are literally false. Usually, this involves giving an account of why the discourse is useful—e.g., talk of fictional narrative is fun, talk of numbers allows us to build airplanes, and talk of morality allows us to organize socially.

In the legal context, there is a long history of conferring legal personhood on corporations, and recognizing that the discourse surrounding corporate legal personhood is fictional. The United States has perhaps the most thoroughly developed legal discourse on the matter. Under U.S. federal law, the term *person* is defined to include corporations.⁵ Participants in the legal system recognize that the discourse surrounding corporate personhood is fictional. As the U.S. Supreme Court wrote, “[T]he corporate personality is a fiction, although a fiction intended to be acted upon as though it were a fact...”⁶ Scholars for

the most part take such statements at face value (Dewey 1926, pp. 655–73; Laufer 1994, pp. 647, 650). Creating a fictional discourse according to which corporations are people was a useful shorthand for conferring on them the legal rights and obligations possessed by human people within the legal system. These include, for example, the corporate right to bind others through contract and the corporate obligation to satisfy commitments under contract. Without an extensive suite of rights and obligations characteristic of legal personhood, corporations could not be the engines of economic progress they have become.

Sometimes legal systems will even confer legal personality on an *ad hoc* basis to individual entities. This happened, for example, with the Bank for International Settlements. In a case involving claims against the Bank, an arbitral tribunal noted that the international instruments that created and empowered the Bank—part of a Convention concluded in 1930 by Germany, Belgium, Great Britain, Italy, Japan and Switzerland—confirmed that the Bank was to be an international law entity. The arrangement was novel, a company limited by shares and, apparently, generally recognized as a person under international law. Some of the participants doubted that this was legally tenable, and so they set up a rather tangled structure to give the Bank a Swiss law status—even as Swiss law was expressly not the Bank’s governing law for its most important purposes.⁷ The Bank was intended to be an international legal person, and the states participating in the Bank communicated their intention by adopting a treaty.⁸ The Bank’s personality was confirmed (the tribunal went on to observe) by explicit statements in other international agreements.⁹

We are concerned here about possible future cases concerning the legal personality of robots. Some academic writings about robot legal personality address questions of personhood in other than a legal sense, e.g., what does it take to constitute a person in a social, biological or even

⁵ Dictionary Act, 1 U.S.C. 1.

⁶ See *Int’l Shoe Co. v. Wash.*, Office of Unemployment Compensation and Placement, 326 U.S. 310, 316 (1945).

⁷ *Reineccius, First Eagle SoGen Funds Inc., et al v. Bank for International Settlements*, Tribunal established Pursuant to Article XV of the Agreement Signed at the Hague on 20 January 1930 (Reisman, Frowein, Krafft, Lagarde, and van den Berg), Partial Award, 22 November 2002, (2004) 23 Reports of International Arbitral Awards 184, 212-213 (paras. 105–106).

⁸ *Ibid.*, p. 214 (para. 112).

⁹ *Ibid.*, p. 215 (paras. 115-16) (“[R]ecognition [of the Bank as a legal person] clearly flows from the provisions of the Agreements.”).

theological sense (Foerst 2009). Legal personality, however, results from a decision in the legal system to confer legal personality on a given entity. This decision may, but need not, be informed by the status of robots as persons vis-a-vis these non-legal senses. Legal personality is a highly elastic concept. The range of actors on which a system might confer legal personality is large, a point understood since at least the 1930s (see Ne'ka'm 1938, p. 34). The European Parliament Motion of 27 January 2017 to consider the possibility of conferring legal status on robots, accordingly, is not trivial. Nothing in the character of legal systems as such forecloses the possibility, and there is significant precedent to enable it.

3.2 Legal personality is divisible

Legal personhood is not an all-or-nothing proposition. Since it is made up of legal rights and obligations, entities can have more, fewer, overlapping, or even disjointed sets of these. This is as true of the legal personhood of human beings as it is for non-human legal persons. Every legal system has had, and continues to have, some human legal persons with fewer legal rights and different obligations than others. The world-wide struggle for equal rights for women, ethnic and religious minorities, and other disadvantaged groups in many nations bears continuing witness to this fact. The disparity is not always invidious; sensible policy can ground different rights and obligations (in some ways more, in others less) for non-citizens, felons, and children (Asaro 2007, p. 3).

As discussed above, legal systems can confer legal personhood on non-human entities. In almost every case, these will have both fewer rights and fewer obligations. Consider the legal personhood that environmental features now have in several countries—the Whanganui river and Te Urewera national park in New Zealand (Rousseau 2016), the Ganges and the Yamuna rivers in India (Safi 2016), and the entire ecosystem in Ecuador.¹⁰ Of necessity, the legal rights and obligations accorded to these environmental features differ

A legal system, if it chose to confer legal personality on robots, would need to say specifically which legal rights and obligations went with the designation.

from those given by their respective nations to human beings. In the case of the Whanganui River, for example, the primary concern was to ensure the rights of the river not to be owned (Calderwood 2016). Corporations in the United States may be the legal persons with the suite of legal rights and obligations most closely approximating those given to human beings. A detailed constitutional jurisprudence has grown around the issue. While the U.S. Supreme Court seems on track to affirm that corporations have nearly every constitutional right and obligation, it has balked in some rare instances, such as the right against self-incrimination at criminal trial.¹¹

In some cases, courts have had to address the divisibility of legal personhood head-on. The General Assembly, in 1948, asked the International Court of Justice whether the UN had the capacity to bring an international claim against a State. The Court advised in the affirmative. In so advising, the Court drew attention to the varied character of persons in a legal system:

“The subjects of law in any legal system are not necessarily identical in their nature or in the extent of their rights, and their nature depends upon the needs of the community... [T]he [UN] is an international person. That is not the same thing as saying that it is a State, which it certainly is not, or that its legal personality and rights and duties are the same as those of a State... Whereas a State possesses the totality of international rights and duties recognized by international law, the rights and duties of an entity such as the [UN] must depend

upon its purposes and functions as specified or implied in its constituent documents and developed in practice.” (Liang 1949)

The Court understood that legal personality is a divisible concept. It is not necessary in any legal system for there to be one uniform and unified status of legal person.

The divisibility of legal personhood raises the question of which rights and duties a legal system should confer on a legal person, once it has decided to recognize the legal person as such. We should resolve the issue of the legal personhood of robots at this level, rather than treating legal personhood as an all-or-nothing black box (Koops et al. 2010, p. 556). Edsger Dijkstra has noted, “A convincing demonstration of correctness being impossible as long as the mechanism is regarded as a black box, our only hope lies in not regarding the mechanism as a black box” (Dijkstra 1970). A legal system, if it chose to confer legal personality on robots, would need to say specifically which legal rights and obligations went with the designation. If it does not, then the legal system will struggle, as happened with the Bank for International Settlements, to make sense of what it has done. To try to confer “legal personality,” without being more specific, is to regard legal personality as a black box. In line with the fictionalist paradigm, and as the ICJ opined with respect to the UN, the legal system should determine the legal rights and obligations of a new legal person by reference to how the legal person relates to the legal system's purposes.

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¹⁰ Ecuador Const., title 10 (“Nature shall be the subject of those rights that the Constitution recognizes for it.”), available at <http://pdba.georgetown.edu/Constitutions/Ecuador/english08.html>.

¹¹ Hale v. Henkel, 291 U.S. 43 (1906).

3.3 The gap between *de jure* and *de facto* legal personality

Even once a legal system has determined which rights and obligations to confer on a legal person, practical realities may nullify them. Legal rights with no way to enforce them are mere illusion. Standing—the right to appear before particular organs for purposes of presenting a case under a particular rule—is crucial to a legal person seeking to protect its rights in the legal system. Standing does not necessarily follow from the existence of an actor’s legal personality. An entity, even when its legal personality is not in doubt, must exercise its standing before it can avail itself of relevant procedures (Vollenhoven et al. 1926). When an entity tries to invoke newly conferred rights, challenges to its standing are all the more likely (Shah 2013).

Consider the legal right of “integral respect” that Ecuador gave to its ecosystem. While the ecosystem may have the right as a matter of law, it clearly lacks the non-legal capacities it would need to protect the right from encroachment. To effectuate the right, the Ecuadorian constitution gave standing to everyone in Ecuador to bring suits on behalf of the ecosystem. Thus, in 2011, private Ecuadorians successfully sued the Provincial Government of Loja to halt expansion of a roadway that was damaging an important watershed (Greene 2011). The outcome would have been very different if Ecuador had provided no mechanism for protecting nature’s legal right of integral respect. Nature cannot protect itself in a court of law.

Just as legal rights mean nothing if the legal system elides the standing to protect them, legal obligations mean nothing in the absence of procedure to enforce them. The advisory opinion of the ICJ establishing that the UN has legal personality was in 1948, but this resolved only whether the UN could bring a claim. It said nothing about an obvious correlate: the legal capacity of the UN to bear responsibility and answer for its own breaches. Affirmation that the UN

indeed can be responsible for its breaches did come—but over half a century later (Wickremasinghe and Evans 2000, para. 66). Despite the efforts of international lawyers, there is still no reliable procedure for suing an international organization.¹²

We could never anticipate *ex ante* all the ways purely synthetic legal people would interact with other legal persons and with the institutions of the legal system (courts, administrative agencies, legislatures, police, etc.). In its first encounters with the legal system, every rule invoked on a robot’s behalf or against it would require novel and controversial developments in law. Courts and other organs would struggle to decide how, if at all, the rules—heretofore addressed to other legal persons—address the robot. Both the robot’s standing against other actors and other actors’ standing against the robot would be sharply contested. If the topic of electronic personality is to be addressed, as directed in the European Parliament’s 27 January 2017 Motion, standing—both of robots and other purely synthetic entities to sue and of others to sue them—is a further matter that would need to be considered.

3.4 Summary

The intricacies described in this section are not just inevitable ‘bugs’ to be eventually worked out. They are crucial questions that we must answer before introducing novel legal personhood. Concerns about legal accountability, and the way electronic persons might affect accountability, are our main motivation in writing this paper. We now turn to consider the impacts of offering some form of personhood status to robots.

4 Human purposes and synthetic personhood

According to the fictionalist paradigm, the advisability of conferring legal personhood on robots is ultimately a pragmatic question—Does endowing robots with this legal right or that legal obligation further the purposes of the legal system? It is an exercise with which judges and legal scholars are familiar from their extensive experience with corporate

legal personhood. As Garrett (2014) and Blair and Pollman (2015) have separately argued, U.S. courts approach individual legal rights and obligations claimed by and against corporations using such a consequentialist framework. We should do the same for each of the divisible legal rights and obligations at issue for robot legal personhood.

A full treatment of the advisability of conferring legal personhood on robots would step methodically from one legal right or obligation to the next. Our primary concern in this paper is to raise a cautionary flag in the face of what seems to be international enthusiasm for extending legal personhood to robots. Elon Musk has recently renewed his apocalyptic predictions about the “existential risk” AI poses to human beings (Domonoske 2017). Our concern is somewhat different, and arises internally to legal systems and how purely synthetic legal persons would interact with human legal persons. Robotic legal personhood raises concerns about a sort of abuse within the legal system: While robot legal persons would enjoy a host of rights against human legal persons, it is unclear how corresponding legal obligations could be enforced against them.

A crucial step in the analysis will be to specify what are the purposes of the legal system in relation to which robot legal personhood should be assessed. Legal systems can be presumed to serve many purposes, and any claim as to what those are is sure to be deeply controversial. Cast at a general enough level, though, much of the controversy about the purposes of legal systems should dissipate. To that end, we claim that the basic purposes of human legal systems are:

1. to further the material interests of the legal persons it recognizes, and
2. to enforce as legal rights and obligations any sufficiently weighty moral rights and obligations, with the caveat that
3. should equally weighty moral rights of two types of entity conflict, legal systems should give preference to the moral rights held by human beings.

¹² Ibid. See also *Behrami v. France*, No. 71412/01 and *Saramati v. France, Germany and Norway*, No. 78166/01, ECtHR, 2 May 2007, Decision (admissibility), 45 EHRR SE 10, para. 149 and comment by Knoll (2008), p. 444.

We think this statement of purpose reflects the basic material and moral goals of any human legal system, with what we hope will be an uncontroversially light thumb on the scale in favour of human interests. Yes, this is speciesism. But a kind that allows for deference to the weighty interests of other entities, via the mechanism of human investment in those entities (cf. the Solaiman 2017 discussion of idols). If there is even the faintest shadow of truth to Musk's prediction, a much stronger version of speciesism would be justified vis-a-vis AI. However, the weaker statement here suffices to make our arguments below.

4.1 Robot legal personhood as a moral imperative

If robots have, or were on course to acquire, moral rights, then granting them legal personhood by conferring some legal rights would further the purposes of legal systems. But there is great room for skepticism about first the possibility of ever designing robots that would hold moral rights, and second whether that possibility—were it to exist—should be realised.

The very grounds of moral rights is highly uncertain for any kind of entity. Some academics suggest that consciousness could be the litmus test for possessing moral rights. Consciousness itself is a tricky notion, and scholars frequently conflate numerous disjoint concepts that happen to be currently associated with the term *conscious* (Dennett 2001, 2009). In the worst case, this definition is circuitous and therefore vacuous, with the definition of the term itself entailing ethical obligation (Bryson 2012). If we could settle on a universal metric for moral patency, that metric could inform whether and when we should give robots legal personhood. At present, any plausible metric should tell against synthetic legal personhood—there is no widespread acceptance that current robots can consistently satisfy these metrics.

Nevertheless, many consider that AI will progress to the point that it can pass

If AI became capable of mimicking human intelligence, the tides may shift as academics and laypeople alike will come to identify empathetically with robots.

any behaviourally observable metric for human-like consciousness. Note that the commonly-suggested Turing Test—requiring that a person interacting with an entity over a communications device mistakes them for human—is already routinely passed at least for limited periods by AI. If AI became capable of mimicking human intelligence, the tides may shift as academics and laypeople alike will come to identify empathetically with robots. For some—the *transhumanists*, who see technology as a mechanism to become themselves superhuman, even immortal (Goertzel 2010; Geraci 2010)—the identification will be even more immediate. Some even self-identify as robots already.

But there is no guarantee or necessity that AI will be developed in this way. It is far from clear that such an AI system would be desirable, and some scholars have suggested that designing such AI would be immoral (Bryson 2009). There is no inevitable point at which AI systems must replicate their makers in becoming functionally similar to human adults. We can therefore ask the question whether such an effort should be attempted. Two options are that it could, like human cloning, be banned altogether; or that human-like AI development should be limited to small-scale, individual, artisanal work, and in particular not be tenable as legal products or business entities that would require fundamental changes to the law (Bryson 2017).

Even if robots were to be constructed on the mass scale and to acquire moral rights, this would not fully settle the question of whether the law should

recognize them as legal persons. Legal systems are flexible as to what actors they confer legal personality upon, and they need no evidence of supposed inherent qualities of an actor in order to do so.¹³ Similarly, the inherent qualities of non-human entities do not dictate the final word on whether they should be recognized as legal persons. Beforehand, we must also check for potential conflicts between possible legal rights of the non-human entity and those already held to be legal persons.

4.2 Abuse of legal person status by robots and those that make them

As Solaiman (2017) emphasizes, it is important that legal persons have legal obligations as well as legal rights. If robots were recognized as legal persons capable of entering into complex legal relationships with other legal persons, there would inevitably arise situations where the acts of robots would interfere with the rights of humans and other legal persons. Without an obligation to respect the rights of other legal persons, those rights would, at least vis-a-vis robotic actors, be rendered a nullity. The solution may seem clear—impose legal obligations on robots. But legal obligations are meaningless if there is no way to hold robots accountable for them. It is not clear that there is.

In seeming recognition of this, the United States Department of Defence has proactively declared in their Law of War Manual¹⁴ that robotic weapons are never responsible legal agents.

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13 This is another point visible in the *Bank for International Settlements* case. One party observed that the functions of the Bank were, in part at least, commercial in character and, from that argued that the Bank was not an international legal person. The tribunal rejected the party's argument: the acceptance of the Bank as an international legal person by the (decentralized) mechanisms of decision in that legal system established that it was a legal person: *Reineccius, First Eagle SoGen Funds Inc., et al v. Bank for International Settlements*, Tribunal established Pursuant to Article XV of the Agreement Signed at the Hague on 20 January 1930 (Reisman, Frowein, Krafft, Lagarde, and van den Berg), Partial Award, 22 November 2002, (2004) 23 Reports of International Arbitral Awards 184, 216 (paras. 116-117). See also Smith's skepticism toward "legal philosophers and students of jurisprudence" who "have not been content with so simple an explanation" and who "have sought for the 'internal nature' of legal personality..." (Smith 1928, 284).

14 U.S. Department of Defense, *Law of War Manual*, §6.5.9.3 (2015), <http://www.defense.gov/Portals/1/Documents/pubs/Law-of-War-Manual-June-2015.pdf>.

“Law of War Obligations of Distinction and Proportionality Apply to Persons Rather Than the Weapons Themselves. The law of war rules on conducting attacks (such as the rules relating to discrimination and proportionality) impose obligations on persons. These rules do not impose obligations on the weapons themselves...The law of war does not require weapons to make legal determinations, even if the weapon (e.g., through computers, software, and sensors) may be characterized as capable of making factual determinations, such as whether to fire the weapon or to select and engage a target... Rather, it is persons who must comply with the law of war...[I]n the situation in which a person is using a weapon that selects and engages targets autonomously, that person must refrain from using that weapon where it is expected to result in incidental harm that is excessive in relation to the concrete and direct military advantage expected to be gained... [T]he obligation...may be more significant when the person uses weapon systems with more sophisticated autonomous functions...”

The concern here is not a necessarily conceptual one. Through very careful planning, we may discover mechanisms by which robots could be held accountable for legal obligations imposed on them. But the planning would have to be careful indeed. Without it, there are two kinds of abuse that might arise at the expense of human legal rights—humans using robots to insulate themselves from liability and robots themselves unaccountably violating human legal rights.

4.2.1 Robots as liability shields

It is to be assumed that if decision makers in the system say that they are ready to consider the possibility of “electronic personality,” then human actors will seek to exploit that possibility for selfish ends. There is nothing objectionable in itself about actors pursuing selfish ends through law. A well-balanced legal

system, however, considers the impact of changes to the rules on the system as a whole, particularly so far as the legal rights of legal persons are concerned. We take the main case of the abuse of legal personality to be this: natural persons using an artificial person to shield themselves from the consequences of their conduct. Recognition of robot legal personhood could present unscrupulous actors with such “liability management” opportunities.

The law has a way to address this kind of difficulty: It can look behind the artificial person and reach a real one. Veil-piercing—i.e., going behind the legal form and helping or (more usually) sanctioning the real people behind the form—is well-known in various legal systems (Huang 2012). A U.S.-Great Britain arbitral tribunal in the 1920s put the matter like this:

“When a situation legally so anomalous is presented, recourse must be had to generally recognized principles of justice and fair dealing in order to determine the rights of the individual involved. The same considerations of equity that have repeatedly been invoked by the courts where strict regard to the legal personality of a corporation would lead to inequitable results or to results contrary to legal policy, may be invoked here. In such cases courts have not hesitated to look behind the legal person and consider the human individuals who were the real beneficiaries.”¹⁵

The situation had been “anomalous” because the Cayuga tribe had legal personality as a corporate entity in New York State but not under international law. That is, the law that the tribunal had power to apply did not recognize the tribe as an entity to which that law could be applied. “[R]ecognized principles of justice and fair dealing” came to the rescue: The tribunal addressed the individuals comprising the tribe to get around its inability to address the tribe.

Solutions like this are not available in every case. Lawmakers contemplating legal personhood must consider the matter and provide for it. The arbitrators in the *Cayuga* case had an express invitation to apply equitable principles,

the jurisdictional instrument (a treaty) having stipulated equity to be part of the applicable law.¹⁶ Where equity or a similar principle is not part of the applicable law, a judge or arbitrator well might not be able to “look behind the legal person.” In a situation like that, the “human individuals” who were meant to answer for injury done remain out of the picture.

The *Tin Council* case provides an illustrative warning. The case involved the International Tin Council, a public international organization constituted by a group of states (broadly an entity like the International Bank for Settlements). The states, using the Council, aimed to corner the world market for tin. When the prospects for success looked solid, the Council contracted debts. But the price of tin collapsed, and the Council went insolvent. When the creditors sought to sue and collect what they could on the debts, they found an empty shell and no procedural recourse. The Tin Council could not be sued in English court, and it would have been useless to sue anyway. The Council’s creditors sought compensation from the member states, but this was to no avail either: The creditors’ contractual relationship was with the Council, not with those who had called it into being. Apart from the possibility of a diplomatic solution—i.e., the states agreeing *ex gratia* to replenish the Council or pay the creditors—the creditors had no recourse.¹⁷

A difficulty in the *Tin Council* case was that the legal relations involved were novel, and so the court’s precedents offered no guide for effectuating the creditor’s rights:

“None of the authorities cited by the appellants [the creditors] were of any assistance in construing the effect of the grant by Parliament of the legal capacities of a body corporate to an international organization pursuant to a treaty obligation to confer legal personality on that organization.”¹⁸

Nor did the creditors adduce “any alleged general principle” in the English law sources that would have allowed the court to pierce the veil and attach liability to the states that had constituted the Council.¹⁹ As for international law, “no plausible evidence was produced of the existence of such a rule of international law” (i.e., a

15 *Great Britain (for the Cayuga Indians in Canada) v. USA*, Tribunal under Special Agreement of 18 August 1910 (Nerinx, President; Pound & Fitzpatrick, Arbitrators), Award, 22 January 1926, (1955) 6 *Reports of International Arbitral Awards* 173, 179. To similar effect a little later, see *Shufeldt Claim (USA/Guatemala)*, (Sisnett, Arbitrator), Decision, 24 July 1930, (1949) 2 *Reports of International Arbitral Awards* 1083, 1098. (“International law will not be bound by municipal law or by anything but natural justice, and will look behind the legal person to the real interests involved.”)

16 *Ibid.*

rule holding the constituents of the Council responsible for the Council's debts).²⁰ In short, unlike the tribunal in the *Cayuga* claims, the House of Lords found no way to avert "inequitable results." The unusual and novel character of the entity led the court to a dead end.

Even when the law does explicitly provide for veil piercing, judges and arbitrators have tended to apply it cautiously and as an exception. Easterbrook and Fischel (though defending the economic rationale for veil piercing) memorably described veil piercing as happening "freakishly"; they likened it to "lightning... rare, severe, and unprincipled" (Easterbrook and Fischel 1985).

The *Tin Council* case foreshadows the risk that electronic personality would shield some human actors from accountability for violating the rights of other legal persons, particularly human or corporate. Without some way around that shield, we would surely see robots designed to carry out activities that carry high legal risk for human or corporate legal persons. Though this might benefit the humans behind the robots, it would come at the expense of human legal interests more generally.

4.2.2 Robots as themselves unaccountable rights violators

Even if the legal system sensibly provided mechanisms for veil piercing in the case of robot legal persons, that solution could only go so far. By design, collective legal persons like corporations and international organisations have legal persons behind them, who might stand to answer for violations of the rights of human legal persons. Advanced robots would not necessarily have further legal persons to instruct or control them. That is to say, there may be no human actor directing the robot after inception. The principal-agent model that veil piercing rests upon would then be hard to apply.

Autonomous or semi-autonomous robots interacting with humans will inevitably infringe the legal rights of humans. Giving robots legal rights without counter-balancing legal obligations would only make matters worse. In the conflict between robot and human legal rights,

only the former would be answerable to the latter; humans would have no legal recourse. This would not necessarily be a problem, if

1. the other problems of legal personality—like standing and availability of dispute settlement procedures—were solved; and
2. the electronic legal person were solvent or otherwise answerable for rights violations.

But it is unclear how to operationalize either of these two steps.

In the case of corporate legal persons, humans composing the corporation can manage dispute settlement on behalf of the corporation in which they have an interest. But what we are imagining here is a robot legal person, untethered from an interested human principal. Who will represent the robot in the dispute? With the right AI, the robot might be able to represent itself. But we may encounter this problem well before AI capable of effective court advocacy is developed. Conceivably, the robot could hire its own legal counsel, but this brings us to the second step: robot solvency.

It is unclear what it would mean for a robot to hold assets, or how it would acquire them. It is possible that the law could contemplate mechanisms for robots to own property or hold accounts, as it does for corporate legal people. The law could also require the creators of robots to place initial funds in these accounts. But money can flow out of accounts just as easily as it can flow in; once the account is depleted, the robot would effectively be unanswerable for violating human legal rights. When insolvent human legal persons violate others' legal rights, other tools are available to hold them to account—anything from apology to jail time. In the case of robots, these options are unavailable, unsatisfying, and/or ineffective.

Good faith efforts, like designing robots in order to avoid infringement of human legal rights, would not solve all the problems either. A machine made to endeavour to avoid breaches of legal obligation still would present risks. Any actor in society will encounter frictions and mischances resulting in legal incident. This is an unavoidable feature of

the complex legal and social space that proponents of robot legal personhood would have robots enter.

5 Conclusion

We have shown that it is completely possible to declare a machine a legal person. The impulse to do so exists both at the individual level with academic proponents, and at the level of international governance with the European Parliament recommending consideration. We have also argued here that conferring legal personality on robots is morally unnecessary and legally troublesome. While it may, either now or in the future, have emotional and economic appeal, so do many superficially desirable hazards against which the law protects us. The basic concern is for protecting human and corporate legal rights against abuse by—or more accurately, by exploiting—robots. Trying to hold an electronic person to account, claimants would experience all the problems that have arisen in the past with novel legal persons. There almost inevitably would arise asymmetries in particular legal systems, situations like that of the investor under investment treaties who can hold a respondent party to account but under the same treaties is not itself accountable. Future claimants, if they were to sue an electronic person, likely would confront the accountable but empty, like the International Tin Council; the fully-financed but unaccountable, like the United Nations; and *sui generis* arrangements like the Bank for International Settlements that novel legal persons tend to instigate.

Perhaps a robot could be likened to a force of nature—a storm or avalanche. But this would not be satisfactory either: Natural forces are not legal persons. They affect our legal relations, but we do not speak of them as *having* legal relations. The electronic person by contrast, would engage in some or all of the legal relations available under the legal system, and yet, for those with whom it transacts or third parties whom it encounters, it would be difficult to hold to account. We have insurance

continued on page 40

17 *International Tin Council Case, JH Rayner (Mincing Lane) Ltd. v. Department of Trade and Industry*, 26 October 1989, House of Lords, Lord Griffiths, para. 178: reprinted (1990) 81 *International Law Reports* 670.

18 *Ibid.*, Templeman, LJ, para. 166.

19 *Ibid.*, para. 167.

20 *Ibid.*, para. 168.

schemes to address floods and fires. You can sue its owner if a dog bites you. The constituent states of the Tin Council, if the court had been willing to pierce the veil, would have stood exposed to the debts it had accrued. An electronic person by contrast might prove to be a legal black hole, an entity that absorbs a human actor's legal responsibilities and from which no glint of accountability is seen. Unfortunately, there is no question that such a readily-manufacturable legal lacuna would be exploited as a mechanism for avoiding and displacing legal liabilities and obligations.

It could be in theory that the benefits justify the costs of introducing purely

synthetic persons to a legal system. Both need to be considered with proper care before moving further toward such an innovation. But in summary of our own investigation, we find the idea could easily lead to abuse at the expense of the legal rights of extant legal persons. We currently have a legal system that is, first and foremost, of, for, and by the (human) people. Maintaining the law's coherence and capacity to defend natural persons entails ensuring that purely synthetic intelligent entities never become persons, either in law or fact.

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Kanagawa police to launch AI-based predictive policing system before Olympics

KYODO

January 29, 2018

YOKOHAMA – The Kanagawa Prefectural Police plan to become the first in the nation to introduce predictive policing, a method of anticipating crimes and accidents using artificial intelligence, sources said Sunday.

The Kanagawa police will seek research expenses under the prefecture's budget for fiscal 2018 starting April, hoping to put a predictive policing system in place on a trial basis before the 2020 Tokyo Olympics, prefectural government sources said.

A system that can determine whether a single perpetrator is behind several crimes, predict an offender's next move and detect where and when crimes or accidents are likely to occur would help police officers investigate crimes and prevent some from happening, they said.

It would allow them to patrol the suggested places at the most likely times to ensure safety and would also help speed up probes, the sources said.

The AI-based system would employ a "deep learning" algorithm that allows the computer to teach itself by analyzing big data. It would encompass the fields of criminology, mathematics, and statistics while gathering data on times, places, weather and geographical conditions as well as other aspects of crimes and accidents.

It may also tap information gleaned from social media.

The Kanagawa police began studying the feasibility of using such a system last year and plans to begin joint research with private-sector entities this spring before putting a system into practice, the sources said.

They have already used a system to list areas with frequent crime, but it has

A system that can determine whether a single perpetrator is behind several crimes, predict an offender's next move and detect where and when crimes or accidents are likely to occur would help police officers investigate crimes and prevent some from happening

fallen short of helping to make extensive predictions.

The National Police Agency set up an advisory panel in December to discuss how it should make use of AI.

Predictive policing is already in use in the United States, where critics are raising concerns that it can be used to violate human rights.

Many police forces in the U.S. use the predictive policing software PredPol, which its website says originated from research by the Los Angeles Police Department and the University of California, Los Angeles.

PredPol predicts areas where a crime is likely to occur by analyzing data about past crimes.

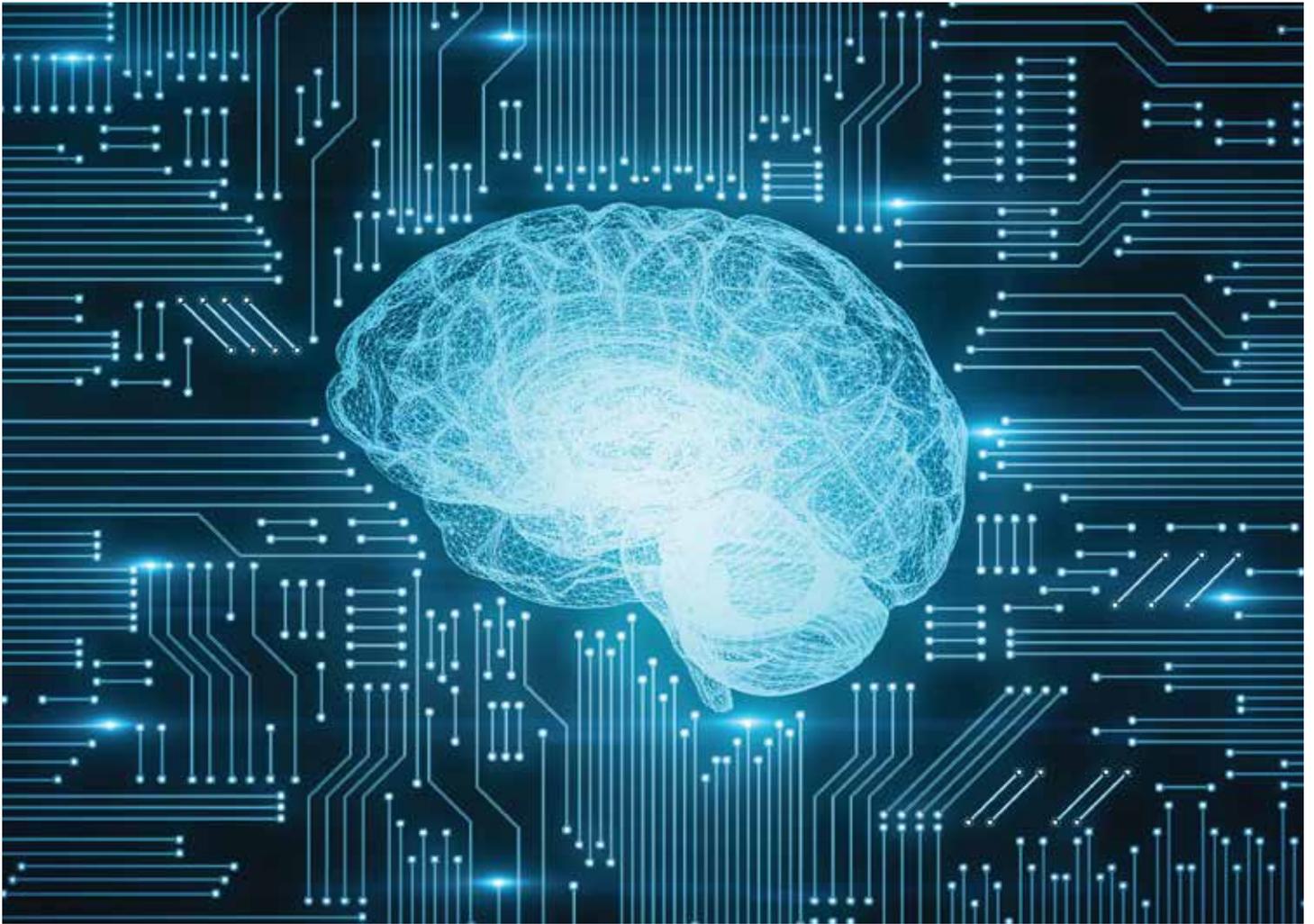
The American Civil Liberties Union and 16 other organizations issued a joint

statement in August 2016 condemning the police for making computerized determinations the reason for questioning people or making arrests.

The statement criticized the system for allegedly promoting prejudice against certain communities and residents.

Toyoaki Nishida, professor of information science at Kyoto University graduate school, said preventive measures would be possible if a hypothesis that crimes are concentrated at particular times and places proved correct.

But using such a method may have negative aspects, such as frequent police patrols of the same areas, he said. Such a system would first need to be accepted by residents before being put into use, he added.



As Artificial Intelligence evolves, so does its criminal potential

Imagine receiving a phone call from your aging mother seeking your help because she has forgotten her banking password. Except it's not your mother.

The voice on the other end of the phone call just sounds deceptively like her.

It is actually a computer-synthesized voice, a tour-de-force of artificial intelligence technology that has been crafted to make it possible for someone to masquerade via the telephone.

Such a situation is still science fiction — but just barely. It is also the future of crime.

The software components necessary to make such masking technology widely accessible are advancing rapidly. Recently, for example, DeepMind, the Alphabet subsidiary known for a

program that has bested some of the top human players in the board game Go, announced that it had designed a program that “mimics any human voice and which sounds more natural than the best existing text-to-speech systems, reducing the gap with human performance by over 50 percent.”

The irony, of course, is that this year the computer security industry, with \$75 billion in annual revenue, has started to talk about how machine learning and pattern recognition techniques will improve the woeful state of computer security. But there is a downside.

“The thing people don’t get is that cybercrime is becoming automated and it is scaling exponentially,” said Marc Goodman, a law enforcement agency adviser and the author of “Future Crimes.” He added, “This is not about Matthew Broderick hacking from his basement,” a reference to the 1983 movie “War Games.”

The alarm about malevolent use of advanced artificial intelligence technologies was sounded earlier this year by James R. Clapper, the director of National Intelligence. In his annual review of security, Mr. Clapper underscored the point that while A.I. systems would make some things easier, they would also expand the vulnerabilities of the online world.

The growing sophistication of computer criminals can be seen in the evolution of attack tools like the widely used malicious program known as Blackshades, according to Mr. Goodman. The author of the program, a Swedish national, was convicted last year in the United States.

The system, which was sold widely in the computer underground, functioned as a “criminal franchise in a box,” Mr. Goodman said. It allowed users without technical skills to deploy computer ransomware or perform video or audio eavesdropping with a mouse click.

The next generation of these tools will add machine learning capabilities that have been pioneered by artificial intelligence researchers to improve the quality of machine vision, speech understanding, speech synthesis and natural language understanding. Some computer security researchers believe that digital criminals have been experimenting with the use of A.I. technologies for more than half a decade.

That can be seen in efforts to subvert the internet’s omnipresent Captcha — Completely Automated Public Turing test to tell Computers and Humans Apart — the challenge-and-response puzzle invented in 2003 by Carnegie Mellon University researchers to block automated programs from stealing online accounts.

Both “white hat” artificial intelligence researchers and “black hat” criminals have been deploying machine vision software to subvert Captchas for more than half a decade, said Stefan Savage,

a computer security researcher at the University of California, San Diego.

“If you don’t change your Captcha for two years, you will be owned by some machine vision algorithm,” he said.

Surprisingly, one thing that has slowed the development of malicious A.I. has been the ready availability of either low-cost or free human labor. For example, some cybercriminals have farmed out Captcha-breaking schemes

As is often the case, whenever a communication advancement like voice recognition starts to go mainstream, criminals looking to take advantage of it aren’t far behind.

to electronic sweatshops where humans are used to decode the puzzles for a tiny fee.

Even more inventive computer crooks have used online pornography as a reward for human web surfers who break the Captcha, Mr. Goodman said. Free labor is a commodity that A.I. software won’t be able to compete with any time soon. So what’s next?

Criminals, for starters, can piggyback on new tech developments. Voice-recognition technology like Apple’s Siri and Microsoft’s Cortana are now used extensively to interact with computers. And Amazon’s Echo voice-controlled speaker and Facebook’s Messenger chatbot platform are rapidly becoming conduits for online commerce and customer support. As is often the case, whenever a communication advancement like voice recognition starts to go mainstream, criminals looking to take advantage of it aren’t far behind.

“I would argue that companies that offer customer support via chatbots are unwittingly making themselves liable to social engineering,” said Brian Krebs, an investigative reporter who publishes at krebsonsecurity.com.

Social engineering, which refers to the practice of manipulating people into performing actions or divulging information, is widely seen as the weakest link in the computer security chain. Cybercriminals already exploit the best qualities in humans — trust and willingness to help others — to steal and spy. The ability to create artificial intelligence avatars that can fool people online will only make the problem worse.

This can already be seen in efforts by state governments and political campaigns who are using chatbot technology widely for political propaganda.

Researchers have coined the term “computational propaganda” to describe the explosion of deceptive social media campaigns on services like Facebook and Twitter.

In a recent research paper, Philip N. Howard, a sociologist at the Oxford Internet Institute, and Bence Kollanyi, a researcher at Corvinus University of Budapest, described how political chatbots had a “small but strategic role” in shaping the online conversation during the run-up to the “Brexit” referendum.

It is only a matter of time before such software is put to criminal use.

“There’s a lot of cleverness in designing social engineering attacks, but as far as I know, nobody has yet started using machine learning to find the highest quality suckers,” said Mark Seiden, an independent computer security specialist. He paused and added, “I should have replied: ‘I’m sorry, Dave, I can’t answer that question right now.’”

A version of this article appears in print on October 24, 2016, on Page B3 of the New York edition with the headline: **As Artificial Intelligence Evolves, So Does Its Criminal Potential.**

AI uses Bitcoin trail to find and help sex-trafficking victims

TIMOTHY REVELL

After Kubiiki Pride’s 13-year-old daughter disappeared, it took 270 days for her mother to find her. When she did, it was as an escort available to be rented out on an online classified web site. Her daughter had been drugged and beaten into compliance by a sex trafficker.

To find her, Pride had to trawl through hundreds of advertisements on Backpage.com, a site that in 2012, the last date for which stats are available, was hosting more than 70 per cent of the US market for online sex ads. When it comes to identifying signs of human trafficking in online sex adverts, the task for police is often no easier. Thousands of sex-related classifieds are posted every week. Some are legal posts. Other people, like Pride’s daughter, are forced to do it. Working out which ads involve foul play is a laborious task.

However, the task is being automated using a strange alliance of artificial intelligence and bitcoin.

“The internet has facilitated a lot of methods that traffickers can take advantage of. They can easily reach big audiences and generate a lot of content without having to reveal themselves,” says Rebecca Portnoff at the University of California, Berkeley.

But a new tool developed by Portnoff and her colleagues can ferret traffickers out. It uses machine learning to spot common patterns in suspicious ads, and then uses publicly available information from the payment method used to pay for them – bitcoin – to help identify who placed them.

The digital trail

The tool will help not only the investigation and intervention of potential traffickers, “but also to support prosecution efforts in an arena where money moves with rapidity across financial instruments and disappears from the evidence trail”, says Carrie Pemberton Ford at the Cambridge

Centre for Applied Research in Human Trafficking.

There are about 4.5 million people who have been forced into sexual exploitation. In the US, many of them end up advertised on Backpage, the second biggest classified ad listing site. People list everything from events to furniture there, but it has also become associated with sex ads and sex trafficking – so much so that the US National Center for

Missing and Exploited Children has said that the majority of child sex trafficking cases referred to them involve ads on Backpage.

Normally, the tell-tale sign that an advert involves trafficking is that the person behind it is responsible for many other adverts across the site. However, this is difficult to spot, as adverts mention the people being trafficked, not the traffickers.



Artificial intelligence trained on thousands of different adverts highlights when similar styles have been used, and clusters together likely candidates for further investigation.

To identify the authors of online sex ads, Portnoff's tool looks at the style in which ads are written. Artificial intelligence trained on thousands of different adverts highlights when similar styles have been used, and clusters together likely candidates for further investigation.

The second step comes via the payment method. Credit card companies stopped the use of their services on Backpage in 2015, leaving bitcoin as the only way to paying for adverts.

Every transaction made using bitcoin is logged on a publicly available ledger called the blockchain. It doesn't store identities, but every user has

an associated wallet that is recorded alongside the transaction. The AI tool searches the blockchain to identify the wallet that corresponds to each advert.

Evidence for the prosecution

It is also easy to see when each ad was posted. "We look at cost of the ad and the timestamp, then connect the ad to a specific person or group. This means the police then have a pretty good candidate for further investigation," says Portnoff.

Once the police know which ads are of dubious origin, they can call the numbers on them in the knowledge that they might well be linked to crime. "Narrowing down from the hundreds

of thousands of ads online will be very useful for law enforcement officers who have to read through so many ads during an investigation," says Portnoff.

During a four-week period, the research team tried out their tool on 10,000 adverts. It correctly identified about 90 per cent of adverts that had the same author, with a false positive rate of only 1 per cent. One of the bitcoin wallets they tracked down was responsible for \$150,000 worth of sex adverts, possible evidence of an exploitation ring.

Backpage has not yet responded to New Scientist's requests for comment.

The team is working with a number of different police forces and NGOs with the hope of using the tool in real investigations soon. The work was presented at the Conference on Knowledge Discovery and Data Mining in Canada this month.

The trafficker who kidnapped Kubiiki Pride's daughter was eventually caught and sentenced to five years in prison. Successfully prosecutions like that are rare, but with Portnoff's new tool that could soon change.

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Policing, technology and terrorism in the 21st century

EMILY SCALLY

Research Assistant at the International Centre for Policing and Security, University of South Wales

Introduction

Contemporary policing is full of threats that were unimaginable twenty years ago, particularly the threat of terrorism. Following the events of 9/11, society's perceptions of policing and terrorism changed (Rubin and Rubin, 2015), and was at this point that the so-called 'War on Terror' began (Combs, 2016; Jeffreys-Jones, 2017) in contemporary terms.

However, whilst the threat of terrorism is still apparent the methods of application appear to have changed. Rather than the large scale events seen on 9/11 in New York and Washington, and on 7/7 in London, terrorist attacks have become less technically complicated, and we now see such modus operandi as large vehicles driven through crowds, with the use of low technology weapons such as kitchen knives becoming the methods of choice.

In this world where terrorism is an international concern and technology is constantly evolving, what is the police role in combatting terrorism? This article

consider and critically examine how the police deal with the changing nature of terrorism in this technological age.

Modern Policing

Police work is evolving day-by-day, as seen with new technologies that are being introduced such as Body-Worn Video cameras (Bud, 2016) and Unmanned Aerial Vehicles (UAVs) (Jones, 2014). This is a reflection of society as a whole, as technology continues to permeate all aspects of life. For example, in the UK, 86% of households have an internet connection (Ofcom, 2017), which demonstrates that even in private, technology is still present. Use of the internet, UAVs and other such technologies are significant to the police because not only can they utilise these technologies, but criminals can too, and can often be ahead in terms of resources and finance, as well as technological ability.

Illegal or socially unacceptable use of technology can include discovering

personal details online (Dukes, 2016) as well as hacking autonomous vehicles in order to cause injury (Jain and Fairley, 2016). Both of these activities can have a great impact upon both the police and the public because the ability of the police to handle such crimes may influence public perception of and trust in the police. Where the police play an instrumental role in combatting terrorism, the level of public trust in the police is more important than ever.

Modern Terrorism

Terrorism as a concept appears to be becoming more "normalised" in everyday life, with its impact influencing government policies, security forces, media announcements and both national and international travel (Combs, 2016). This wide-ranging influence could be one of the problems with defining terrorism (Combs, 2016). In the United Kingdom (UK), terrorism is defined in the Terrorism Act 2000 as an "act



which can cause significant injury, contain serious violence or property damage with the intent to influence the government or advance a cause of an ideological or political root” (Home Office. Terrorism Act 2000). Similarly, in Australia, whilst an act of terrorism has the same outcomes as those in the UK, the legal definition includes acts that occur in the Commonwealth and foreign countries, not only Australian territory (Criminal Code Act 1995, (No.12)). In the United States of America, the definition of terrorism also states that an act of terrorism has the purpose of influencing the government but also includes the want to intimidate the public through acts that cause a danger to life (United States, 2001). These different definitions of terrorism highlight both differences between the countries, but also similarities. This then could of course mean that the responses to terrorism may also be similar in relation to the work of the respective security and law enforcement agencies.

Context of Modern Terrorism

Terrorist activity became more structured as the political will of the public increased (Rubin and Rubin, 2015). As national identities developed and the want for social revolution became an actuality, terrorism became a method of protest (Rubin and Rubin, 2015; Combs 2016). This is not to say that all political developments involved terrorist acts (Rubin and Rubin, 2015) but that this was a method employed by some groups. Throughout the history of the Western World, examples of terrorism can be seen with political motives. One of the earliest historical instances to be discussed in relation to terrorism is Guy Fawkes’ attempt to destroy the UK Parliament with some examples even predating that (Wade, 2016). In addition, there are some examples which developed into totalitarian regimes, such as Nazi Germany and Stalinist Russia (Rubin and Rubin, 2015). The history of terrorism as a political or religious protest is important in understanding it as a concept. However,

one large-scale event changed the face of terrorism into what we recognise today.

The attack on the USA in 2001 changed the face of terrorism by showing how devastating attacks could be as well as causing counterterrorism efforts to become a priority for many countries (Rubin and Rubin, 2015). In the USA, the Patriots Act 2001 was signed into law, giving intelligence agencies more powers, including those relating to surveillance (Jefferys-Jones, 2017). Similar increases in government powers were seen in the UK (Jefferys-Jones, 2017) suggesting that the British and American methods of counterterrorism were similar, which in turn, influenced how the police combat terrorism in their separate countries.

Despite these increases in powers to combat terrorism, it has been suggested that the aims of terrorism have not changed drastically over time. However, the methods employed by terrorists have changed (Combs, 2016).

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Conversely, it has also been suggested that 9/11 showed a drastic increase in the scale of terrorist attacks but not in the technological advances of terrorists because they recognised the use of machines which were in use in everyday society (Allen, 2017). The same could also be said of the most recent terrorist attacks in Europe. In the UK, 2017 has seen multiple terrorist attacks using vehicles, knives and nail bombs (Welch, 2017), highlighting a change of tactics by terrorists, using low-tech items which are easy to obtain. These attacks have had devastating consequences and caused the terror threat level in the UK to be continually at 'highly likely' over a long period of time (Welch, 2017). The question arises as to how the police can respond to the change in modus operandi in view of the fact that the threat levels remains the same.

Response to Terrorism

In England and Wales, police counterterrorism strategies are informed by the CONTEST strategy (Awan, 2016). It involves four main pillars: Prevent, Pursue, Protect and Prepare (Awan, 2016; HM Government, 2011). Together, these four areas combat terrorism through attempting to stop radicalisation, to stop attacks from occurring, to increase strength and resources and to reduce the impact of a terrorist attack (HM Government, 2011). This then influences the work of the police in their own force areas. However, the British Government recognises that countering terrorism is not something that can be accomplished by an individual state: international partnerships are important to the success of the CONTEST strategy (HM Government, 2011).

In Australia, the Council of Australian Governments set out a counterterrorism plan in 2015: Australia's Counter-Terrorism Strategy (Australia New Zealand Counter-Terrorism Committee, 2017). In this plan, five areas are described as being interconnected which are necessary for countering terrorist threats to be successful (Australia New Zealand Counter-Terrorism Committee, 2017). These are similar to the four pillars of the British CONTEST strategy (HM Government, 2011) and are focused upon challenging violent extremism, protecting Australia and its citizens, having

effective responses to terrorism and influencing the global counterterrorism effort (Australia New Zealand Counter-Terrorism Committee, 2017). The similarities between the Australian and British strategies shows that there is an international effort to combat the threat posed by terrorism and that the impact upon police officers is similar even in different countries. This once again emphasises the idea of international partnerships.

An example of international cooperation in relation to counterterrorism can be seen in the work of Europol. This organization was created to combat cross-border crimes of a serious nature in the European Union (EU), of which

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terrorism is one (Joyce, 2016). It was created before the attacks of 9/11 and was therefore suitably structured to easily undertake more responsibilities in the counterterrorism arena (Jansson, 2016; Bures, 2016) rather than creating a new entity to focus on combatting terrorism in the EU. Although Europol is not a police force with powers to combat crime over that of member states, it is present to improve cooperation among different countries (Bures, 2016). Therefore, it is linked to counterterrorism, as seen through the existence of the European Counter Terrorism Centre (ECTC) (Europol, 2017). Such organisations show that combatting terrorism requires cooperation and work at all levels of policing.

Therefore, national and international strategies are important to counterterrorism. However, they cannot be successfully

implemented without information and intelligence. One method of obtaining this data is through community-based policing, an approach which recognises that the sources of terrorism have changed (Klausen, 2009). This does not mean that other covert methods of counterterrorism such as surveillance are not needed, but is a recognition that community policing's requirement of community involvement (Segrave and Ratcliffe, 2004) is also needed. Following the London terrorist attacks of July 2005, the accreditation to certain terrorist acts was given the name 'home-grown terrorists' (Klausen, 2009). The idea of terrorists being radicalised in British soil caused policy makers to refocus their efforts on building relationships with communities rather than just policing them (Klausen, 2009). This is a British example yet could be applied to many other states. This once again emphasises the need for the public to trust the police as the public may have significant information about potential terrorist activities which are not obtainable through technology.

Technology and Counterterrorism

A more complex method of countering terrorism is the increasing use of technology by police forces and intelligence services. The use of technology in police work generally is increasing day by day and such technologies that appear to be more useful in the local setting can still be used for more serious crimes. For example, Automatic Number Plate Recognition (APNR) cameras can be used in order to deal with crimes such as burglary (Police Professional, 2016) but can also be used to combat serious and organised crime (National Police Chief's Council, 2016). This suggests that there is the ability for police to utilise this technology to aid in their counterterrorism work because it has been successfully implemented against organised crime and therefore shows potential to be used against terrorist activities.

Another technology that can be implemented in the counterterrorism field is that of social media. Social Media has changed the way that society communicates (Weimann, 2015) which suggests that it may have also changed how the police communicate with the public. For the police, there are three main categories of use for social media: sending and receiving information to and from the public (Crump, 2011; Leirberman

et al., 2013; Reuter et al., 2016; Harms and Wade, 2017); engaging the community in police work (Crump, 2011; Leiberman et al., 2013; Brainard and Eldins, 2015; Kelly, 2015; Bailey, 2017); and in a surveillance capacity (Trottier, 2012, 2016; Kelly, 2015; Harms and Wade, 2017). Social media is therefore a useful technology for the police to use in relation to counterterrorism efforts. There is an exchange of information, engaging with aspects of the community and the ability to survey members of the public on their social media accounts. Social networking sites, such as Facebook and Twitter, are open sources and can be used to make connections between people and places (Trottier, 2012). This is significant for counterterrorism policing because the police are able to gain information and intelligence via social media in differing forms to use in their efforts of counterterrorism.

However, social media also has a negative relationship with terrorism. There is now the ability for members of the public to become radicalised purely through the content they see on social media sites such as Facebook and YouTube (Weimann, 2015), creating more “home-grown” terrorists. In addition, not only does the ease with which people can become sympathetic with terrorist organizations, social media allows terrorist groups to communicate among themselves without having a covert physical location for law enforcement or defence agencies to target (Weimann, 2015). What is more, the ease with which organizations can disseminate documents and information about themselves and what they perceive to be their “mission” means that more terrorist groups are using social media (Weimann, 2015). Consequently, the police must also consider this use of social media, not simply how social networks can aid in police work. Combatting the use of sites like Facebook and Twitter for radicalisation must be part of counterterrorism policing as there are fewer members of the public being radicalised in person (Weimann, 2015). Therefore, the use of social media in counterterrorism policing is both positive and negative yet is of significance because more and more of everyday life is being lived on social media (Trottier, 2016).

In addition, another form of technology, which is permeating everyday life and police work, is the unmanned aerial

vehicle. For the police, there are various suggested uses, including surveillance (Jones, 2014; Hiltner, 2013; Schlag, 2013; Button and Underhill, 2016) as well as operational support for firearms units (Metropolitan Police Service, 2017). These are two of many uses of drones in modern day policing, suggesting that UAVs will be part of policing for some time because of the wide-ranging uses for them. In relation to their use in combatting terrorism for example, large crowds or events are now targets, as seen through recent attacks in Europe (Welch, 2017). With their ability to support large scale events (North Wales Police, 2017), drones can be a useful addition to the police's ability to counter terrorist attacks at large-scale events.

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However, there are problems associated with the increase of drones in the domestic sphere. Drones may be used to counter terrorist attacks, but there is also the threat of them being used to carry out an attack. This has led police forces to consider methods of countering UAVs, with one example being that of the police in The Netherlands. Their current method of countering drones is to train birds of prey to capture airborne UAVs similar to what the birds would do to prey in the wild (Agence-France Presse, 2016). This is one method of countering the technology using non-technological devices and is something that other forces may also be interested in (Rawlinson, 2016) suggesting that there is a recognition that drones can be a threat and that there needs to be a method of disabling that threat. Therefore, in relation

to terrorism, the use of drones can be both positive and negative for the police.

In addition, as technology use increases, such as social media and ANPR, one must also consider the increased requirements for data storage (Aston, 2017). The police in the UK are currently considering storage options (Aston, 2017) but they must also take into account the resilience of their IT infrastructures. Introducing IT in policing does not mean simply adapting old systems to new practices but ensuring that new systems are functioning at their potential and are secure from any new threats to the infrastructure (Newman, 2017). This relates to terrorism as radicalisation can occur online (Weimann, 2015) as well as the UK Government recognising that there is an increased threat to IT systems and that organizations such as the police need to be prepared for any cyber-attacks (Newman, 2017). This illustrates that the police role in combatting terrorism in a technological society does not just revolve around how technology can be used to stop terrorists, but also to support police work in the counterterrorism arena.

Over the past decade, policing in Britain has faced reductions in budgets in what has become to be known as ‘The Age of Austerity.’ There was, and is, a recognition that demands on the police are continually increasing whereas resources are not (Gravelle and Rogers, 2011), with terrorism being one such big demand. Technology has long been seen as a potential answer to a lack of resources, with an example being the introduction of street lighting in the 1850s as a method of crime reduction rather than a patrolling constable (Brogden and Ellison, 2013). So whilst technology has always had a place in policing, particularly when resources were lacking, the continued use and exploration of technology in the face of austerity will continue. Technology has allowed the police to share information quickly and deter certain, low-level crimes (Brogden and Ellison, 2013), which aids in counterterrorism efforts because information sharing is important. Therefore, even in a climate of restricted budgets, the police may be able to use technology to their advantage in their counterterrorism work.

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Conclusion

Policing today involves much more technology than previous decades, introducing a complex social world with various social platforms (Crump, 2011; Leirberman et al., 2013; Reuter et al., 2016; Harms and Wade, 2017; Brainard and Eldins, 2015; Kelly, 2015; Bailey, 2017; Trottier, 2012, 2016). Across the globe, the police are now dealing with

new, technology-based crimes, as well as changes in terrorism tactics from the technological to the easily obtained (Welch, 2017). There are national and international strategies for combatting terrorism (HM Government, 2011; Europol, 2017) which use both traditional and innovative methods of investigation and combatting threats. However, technologies are providing new opportunities for the police in counterterrorism efforts through its open source nature (Trottier, 2012),

illustrating that the police are adapting to a world where terrorism is also online.

Policing terrorism, as well as other criminal acts, in the 21st Century is not a simple undertaking, with the police trying to keep up with technology in relation to what they can use and how they use it within limited budgets and resources. However, the potential for its use in fighting crime is enormous, and will no doubt expand significantly in the next decade or so.

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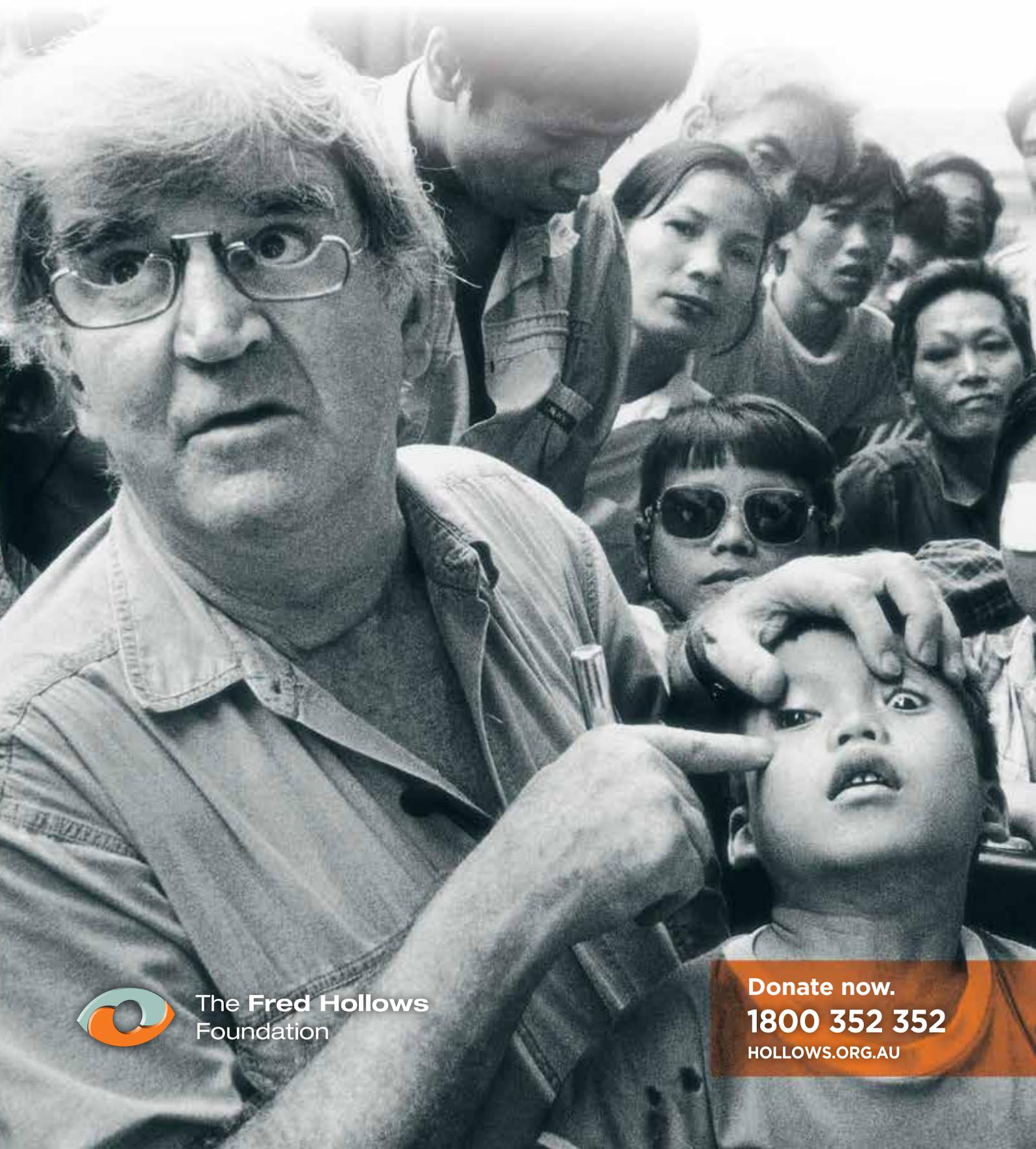
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Dutch police use augmented reality to investigate crime scenes

TIMOTHY REVELL

You are the first police officer to arrive at the scene: a suspected ecstasy lab. There is drug paraphernalia everywhere, but which piece of evidence could be most helpful for your investigation? Then, a massive virtual arrow appears, pointing out a bottle of chemicals, accompanied by a note saying: “Bag this please”.

Dutch police are trialing an augmented reality (AR) system that streams video from body cameras worn by officers to experts elsewhere. These experts can then guide the officers by annotating the scene virtually with notes that the officers can see on a smartphone or head-mounted device like Google Glass.

“We now have good enough software and hardware to use augmented reality at crime scenes,” says Dragos Datcu, principal researcher at AR company Twinkl in Rotterdam, the Netherlands.

Datcu and his colleagues at the Delft University of Technology have been developing the AR system for five years and have now tested it in collaboration with the Dutch Police, the Netherlands Forensic Institute and the Dutch Fire Brigade. “In six months, the police will be able to buy the complete package,” he says.

Location, location, location

When an officer arrives at a crime scene, it is often important that they explore it immediately – there could be a suspect hiding, or a dangerous chemical giving off toxic fumes. But the first person there is not necessarily the most qualified to investigate. The new system aims to allow the most relevant experts to get actively involved in the search, even if they’re hundreds of kilometres away.

Using the prototype, a police officer can view an AR version of the scene in front of them on a smartphone or head-mounted device. As they explore the area, footage from a camera on their vest is sent to people at different locations, such as forensic scientists or chemical specialists. These remote colleagues



No, not the chair. The bottle on the chair.

can add information and notes to the officer’s AR view, ranging from a request to explore a particular area to a big arrow saying “body here”.

It’s a similar principle to the Pokémon Go smartphone game, which allows players to catch virtual creatures that appear transposed over the real world when viewed through a smartphone.

“We’ve tried the system and it really adds a lot of value to many different areas of policing,” says innovation adviser Nick Koeman from the National Police of the Netherlands.

Cut out contamination

The technology isn’t suitable for use when making an arrest, Koeman says, because officers trialing the system sometimes found the additional information distracting. But it is ready for more routine aspects of policing like crime scene investigations. “The technology makes it possible to get the right information to the right people at the

right time, in a way that’s easy to see,” he says.

While it would be preferable to have a team of the most suitable investigators search every site in person, this isn’t always possible because of time and cost constraints.

The system could also keep numbers at a crime scene to a minimum without sacrificing thoroughness. The more people you have at a crime scene, the more likely you are to find important evidence – but you also raise the risk of accidentally contaminating evidence.

With AR, many people can help uncover clues without physically touching anything. The recordings from the system could also potentially be used in court.

“The advantage of augmented reality is the potential ability to recreate a crime scene for a jury,” says Michael Buerger, professor of criminal justice at Bowling Green State University in Ohio. However, Buerger says there are likely to be legal challenges the first time AR is used as evidence.

Dubai Police to deploy robotic patrols

June 27, 2017

ALI AL SHOUK

Gulf News

Self-driving mini police vehicles will use biometrics to scan crowds and identify criminals, or suspects.

Months after Dubai unveiled the first flying taxis in the world, Dubai Police on Tuesday unveiled another believed world's first — autonomous, self-driving miniature police cars that are expected to hit the streets by year-end.

The robotic vehicles will be equipped with biometric software to scan for wanted criminals and undesirables who are suspected or are breaking laws, police said.

Patrol vehicle

About the size of a child's electric toy car, the driverless vehicles will patrol different areas of the city to boost security and hunt for unusual activity, all the while scanning crowds for potential persons of interest to police and known criminals.

The new security system is so advanced that the mini-vehicle even comes with its own drone which can be launched via a rear sleeve — both are monitored and linked to Dubai Police command room.

Dubai Police signed a new deal with Singapore-based OTSAW Digital to deploy the new autonomous outdoor security robots — called O-R3 by the firm — as part of the Smart Dubai initiative, making Dubai the first city in the world to have O-R3 in operation, said police.

The memorandum was signed by Major-General Abdullah Khalifa Al Merri, Commander-in-Chief of Dubai Police, and Ling Ting Ming, CEO of OTSAW Digital, at Dubai Police headquarters.

Smarter city

"Dubai Police are keen to get the latest technology to fight crime. We always search for the best technology to serve our police work for a safer and smarter city. We seek to augment operations with the help of technology such as robots. We aim for streets to be safe and peaceful even without heavy police patrol," Maj-Gen Al Merri said.



Dubai Police said the new smart vehicle can patrol different areas and monitor any unusual activities as well. Image Credit: Dubai Police

"We always look to achieve Dubai's vision of becoming a Smart City. We expect it will be ready during the next Gitex fair," he said.

On its company website, OTSAW hails its new driverless vehicle as groundbreaking for the future of police surveillance for large cities such as Dubai.

The company said its world's first autonomous security robot features an antenna and ground surveillance system.

OTSAW also noted that the O-R3 performs 360-degree surveillance and deters potential crime with its formidable presence on site. With self-charging capability, patrol and protection is provided 24/7, all year round.

"Ultimately, robots exist to improve the quality of human lives, where men take on high-value jobs while robots perform the low-skilled ones," Ling Ting Ming said.

The company said that it expects the O-R3 to begin policing Dubai by the end of 2017.

Brigadier Khalid Nasser Al Razooqi, director of the Smart Services Department in Dubai Police, said the new

car has cameras and will be linked to the command room.

Tracking suspects

"It can recognise people in any area and identify suspicious objects and can track suspects. It has a drone and the user [police officer] needs to access the car through fingerprint. It will be deployed at tourist destinations in Dubai," Brigadier Al Razooqi said.

Police will send a team headed by Lieutenant Salim Saqr Al Merri to the company to participate and supervise the final stages of building the car.

The latest news from Dubai Police comes on the heels of word earlier this year at the World Government Summit that Dubai is also set to become the world's first city to use flying taxis.

In April, Roads and Transport Authority (RTA) officials said they will begin a trial run of 'flying taxis' in 2020.

The RTA said at the time that it will carry out the test flight of Vertical Take-off and Landing Vehicles (VTOL) in partnership with Uber.

According to Uber, the first demonstration network is expected to be ready for Expo 2020.



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- Save You **Stress**
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Scott Haywood

Certified Financial Planner
Haywood Financial Management & Partners
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TASMANIAN CHINESE BUDDHIST ACADEMY OF AUSTRALIA DHARMA DISSEMINATION PICTORIAL REPORT

14th Annual General Conference of World Buddhist Sangha Youth (WBSY) & Inaugural Conference of World United Buddhist Sangha Cultural Exchange Council (UBSC)



SRI LANKA

26 OCTOBER - 3 NOVEMBER



His Excellency Maithripala Sirisena, President of Sri Lanka, graced the Closing Ceremony of WBSY and UBSC conferences. Master Wang presented a spiritual gift to His Excellency.



His Holiness Most Ven. Warakagoda Chanarathana Mahanayaka Thero of Asgiriya Chapter of the Siyam Nikaya, received Master Wang and the Academy's delegation.



At the Closing Ceremony, Master Wang emphasised the need for a united front among all Buddhist schools, including Theravadayana, Mahayana, Vajrayana, Tantrayana, and Zen.



Master Wang and the Academy's delegates paid homage to Temple of the Sacred Tooth Relic of Lord Buddha in Kandy, which is one of the most venerated temples in Sri Lanka.



Around 50 venerable Sangha gathered at Matale to convene the 7th Spiritual Dialogue between Theravadayana, Mahayana, and Tantrayana Buddhism.



Most Venerable Mugunuwela Anuruddha Mahathero, Secretary-General of WBSY and Lifetime Secretary-General of UBSC, welcomed the delegates from the Academy at Colombo airport.



Delegates from dozens of countries took a group photo with the UBSC flag at the conclusion of the Opening Ceremony.



Traditional Sri Lankan Ves dancers and the Holy Tantra Lion Dance team pictured together after welcoming His Holiness Mahanayaka Thero and Education Minister the Hon. Akila Viraj Kariyawasam.



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