

DP200100189: How Facial Recognition Technology Transforms Public Space

AIMS AND BACKGROUND:

Cameras equipped with facial recognition technology are radically transforming public spaces in Australia. Schools, cafes, factories, airports, malls, and government buildings are installing smart cameras that can identify people and track their movements through the course of the day. These ‘smart’ cameras are becoming increasingly widespread because they promise myriad benefits and conveniences including speedy and secure transactions, customized services, and enhanced public safety and security. In the near future, for example, we will be able to board public transit and withdraw money from ATM machines using our faces as IDs. Shops will be able to identify shoplifters and recognise regular customers to provide them with customized service, while schools and employers will be able to track attendance and hours worked automatically (Blunden, 2018). Facial recognition systems are likely to become increasingly widespread in the near future, thanks in large part to China’s huge investment in the hardware and software for smart camera systems (Yang, 2017; Murphy, 2018).

The widespread use of facial recognition technology would create detailed databases about people’s actions and whereabouts, raising a host of concerns about control over our personal information and the uses to which it is put. In China, for example, facial recognition systems are used to identify and publicly shame jaywalkers by displaying their names on electronic billboards and police are equipped with ‘smart’ glasses that identify criminal suspects (Dodds, 2018; Connor, 2018). It can also be used to target dissidents and restrict their access to services including train and airplane travel (Carney, 2018). The technology transforms the spaces through which we move into a visual sensing system that promises to reconfigure our experience of what it means to be ‘out in public’ by making comprehensive tracking the rule rather than the exception -- for everyone. As the technology develops it will treat the face not just as a form of biometric identification, but also as a new source of demographic and psychographic data.

Facial recognition systems have profound and wide-ranging societal implications for the power of state and commercial institutions to track, sort, and target individuals and thus for our experience of shared space (whether these are publicly or privately controlled). This project proposes the first systematic research in Australia about public attitudes and concerns toward the implementation of this technology and its emerging uses. It will provide empirical research to help inform policy discussions regarding best practice implementation and regulation of this technology, while also pioneering theoretical approaches to understand and evaluate its social impact.

The project has 4 aims:

1. To canvass the state of anticipated future uses of facial recognition technology in Australia.
2. To develop an analysis of the cultural and behavioral dimensions of the widespread deployment of the technology, by drawing on the example of China, which is pioneering the development and implementation of facial recognition systems.
3. To develop a conceptual ‘toolbox’ and a theoretical approach to the societal implications of the transformation of ‘public space’ associated with automated recognition, focusing on four contexts: security and public safety, education, commerce, and the workplace.
4. To conduct two national surveys on public attitudes toward the use of facial recognition technology in contexts including the four focus areas of the project.

Background

The issues related to facial recognition technology will rapidly become important ones in Australia, which has been an early adopter of automated monitoring systems, including traffic cameras, automated commercial monitoring systems, and public security cameras. CCTV has become one of the most prevalent monitoring technologies in public spaces in Australia (Hulme, Morgan & Brown 2015, 2017). Facial recognition technology is already being integrated into existing surveillance systems, including a pilot public safety program in East Perth (O’Flaherty, 2018), an airport security system at Sydney Airport (Farquhar, 2018), and security cameras on a military base and in an office complex in Canberra (Welch, 2018). The addition of facial recognition capability to CCTV systems will expand the potential use of such systems for security, commerce, education, work, health care, and more. Independent schools in Australia have already trialed facial recognition cameras to keep track of students (Squires, 2018). In other sectors, facial recognition technology is being used by cafes to identify repeat customers (and their regular orders) (Bolger, 2018); in workplaces for workers to clock in and out; and the Department of Home Affairs proposes to use the technology at airports to screen travellers at Australian airports by matching face scans to images on the internet, watch lists, criminal databases and social media (Burt, 2018). Cameras equipped with facial recognition technology are used in the Crown Casino in Melbourne to identify VIPs and banned guests and by South Australia Police to identify criminals and search for missing persons (Grubb 2018). The NAB has developed a proof-of-concept system to use facial recognition to allow users to withdraw cash at ATM machines. Facial detection (which doesn’t ID faces, but reads expressions and tracks individuals) is used by Westfield shopping malls in Australia to record the gender, age, and “mood” of individual shoppers (Anscombe, 2017). It is a short step from detection technology to identification technology once commercial outlets link camera data with purchasing information. Once facial recognition systems

are in place, detection applications (such as “mood” inference) will also be implemented for purposes including marketing and threat detection. The US Department of Homeland Security is developing systems to infer ‘malintent’ (the intent to do harm) from visual and biometric cues (Ackerman, 2017). Under existing law in Australia, retailers do not need the consent of shoppers to collect data obtained through CCTV cameras -- a policy likely to be revisited once smart cameras are installed more widely.

The Australian Department of Home Affairs has proposed laws that would authorize the creation of a facial recognition database created from the photos taken for Australian drivers’ licenses, passports and ID cards. These laws, proposed for counter-terrorism purposes, would also allow the technology to be used for general-purpose law enforcement, a prospect that has triggered criticism as being overly broad in scope (Karp, 2018). The only recent Australian survey on public attitudes toward facial recognition systems was an SMS snap poll conducted by Roy Morgan Research indicating that two-thirds of the Australian population supported the use of mass facial recognition technology, “under anti-terror measures” (Roy Morgan, 2017). However, the poll did not capture information about attitudes toward the use of facial recognition technology for a range of other purposes in schools, shops, banks, train stations, and the workplace. Given the interest in the technology for a growing range of purposes, it will be important to anticipate future uses and to establish a sense of how the public assesses the relationship between security, convenience, and the collection of personally identifying data in a growing range of contexts. China’s social credit system, which couples facial recognition systems with other data sources to rate citizens’ economic and social reliability, has recently received widespread critical coverage in Australia (Carney, 2018; Palin, 2018; Ma, 2018), raising concerns about the possibility of function creep and the use of facial recognition technology for new forms of social control and influence.

Facial recognition technology transforms the process of identification from active targeting -- as in the case of attempts to identify individual persons of interest -- to passive and generalized recognition: by default, everyone who passes in front of the camera is identified. Geography is a great revealer: knowing where people go provides intimate and wide-ranging information about their professional, personal, and leisure lives (Mayer, 2013). While it is tempting to suggest that lifting of the veil of anonymity heralds a return to pre-modern, pre-urban, village life, the rise of smart cameras is qualitatively and quantitatively different. The memories it generates are recorded and stored in machine form, the monitoring is asymmetrical (people are seen, but the tracking systems often go un-noticed), and the image processing takes place at a super-human scale. No human can recognize and identify all 100,000 faces in a football stadium, but smart camera systems are being developed to do so.

Given the current state of the technology, there are also concerns about large-scale misidentification (Brandom, 2018) and machine bias (systematic misrecognition by skin color or ethnic background). Recent research suggests that we are still far short of having systems that can accurately identify everyone in a large crowd (Reilly, 2018), while some systems work better on certain groups than others (Simonite, 2018). These shortcomings are generally treated as issues to be addressed by increasingly large training sets and sophisticated machine learning systems. With an eye to resolving these issues, Chinese facial recognition companies have been soliciting and receiving large scale international investment, raising close to \$2 billion in one week alone in 2018 (Condliffe, 2018). At the same time, industry leaders in the US have been criticized for developing facial recognition capabilities for police and the military. Shareholders lobbied Amazon.com not to sell its facial recognition software to the police, and Google eventually backed away from a plan to work with the Pentagon to improve image recognition for drone warfare (Neidig, 2019; Wakabayashi and Shane, 2018). From a cultural, political, and economic perspective, China finds itself well positioned to take on a leadership role in developing the technology, and Australia, because of its close ties with the country, its existing investment in CCTV monitoring, its security concerns, and its interest in developing frontier technologies, is poised to continue its role as an early adopter of the technology.

The goal of this project is to undertake the foundational social research to help public, academic, and regulatory discussions keep pace with the rapidly developing technology. Ensuring the technology is deployed in accordance with democratic commitments and human rights requires coming to terms with its capabilities. Thus this project will have **empirical** and **theoretical** components. The **empirical** work includes research on the current state and future applications of facial recognition technology, derived from documentary research, interviews with industry representatives and visits to trade shows, and on-site case studies of the deployment of the technology in Australia in four focus areas: commerce, security, education, and the workplace. It will also draw on national surveys in China and Australia and on follow up interviews in Australia. The **theoretical component** will entail developing a conceptual toolbox for understanding the changes ushered in by automated facial recognition technology and anticipating its future capacities and uses.

INVESTIGATORS

The proposal brings together expertise in urban policy and planning, digital media in China, media studies, surveillance and criminology, and education, digital media and everyday life. Lead CI Andrejevic is an internationally recognized scholar in the area of automated surveillance and has published pioneering work on the

relationship between interactive digital media and the surveillance economy. The conceptual frameworks he developed with respect to the “work of being watched” (the productivity of interactive monitoring) and “the digital enclosure” (the ways in which interactive platforms capture and monetize a growing range of transactional and communicative information) have played an influential role in the development of digital media studies and will inform the theoretical approach to the proposed research. His more recent work on automated monitoring explores shifts in the practice and function of data capture in the era of data mining and predictive analytics. Andrejevic also led an ARC-funded project on Australians’ attitudes toward the collection and use of their personal information for commercial purposes (DP1092606). His research has provided an original framework for approaching the automation of surveillance and for identifying its defining elements (2007; 2013; 2014). CI Andrejevic has a well-established track record of incorporating in-depth interviews, focus interviews, and surveys into his research (2004, 2007; 2013; 2014). He has a strong international network of research colleagues built during senior appointments he has held in the U.S., invited talks in locations including Korea, China, Sweden, Finland, Switzerland, Turkey, and New Zealand his participation in the Council for Big Data, Ethics, and Society, and his collaboration with Canadian and UK scholars on two Canadian SSHRC funded projects. He provides the project with longstanding research expertise in theoretical and empirical research on surveillance, monitoring, and automation. He has developed networks in the academic community devoted to the study of digital media, in the educational community (working with education groups on data privacy in schools), and in the privacy rights community. He also has experience advising Ph.D. students to completion in the U.S. and will take the lead supervisory role for the Ph.D. student who would be supported by Monash as part of the University’s contribution to the project.

CI Neil Selwyn is a widely cited and influential sociologist whose expertise in the study of digital media has earned him a prominent international reputation. He has written extensively on issues that relate directly to the implementation of facial recognition and other data-driven technologies in a range of contexts, especially schools and education. He has conducted pioneering work on questions of digital exclusion, social justice and digital surveillance, and information society policy. This has led to the development of widely used original frameworks on digital divides, technology non-use, and recent concept-building in the area of personal data literacies. Selwyn’s expertise in the use of technology in schools will play a key role in work on the implementation of facial recognition systems in both China and Australia. In particular, Selwyn’s recent work has seen him lead an in-depth ethnographic study of digital technology use in Australian schools (DP140101258), and current work on the datafication of Australian secondary schools (DP190102286). Other recent projects have involved in-depth ethnographies of EdTech industry trade shows, public opinion surveys of future technology acceptance, and critical participatory design projects to support school students’ data obfuscation and surveillance practices.

CI Gavin Smith is a sociologist with internationally recognized expertise in surveillance studies, specifically contributing pioneering insights on (a) the social relations that affect everyday practices of “dataveillance” in various organisational and cultural contexts and (b) the phenomenology of performing surveillance work, both from the perspective of *the watchers* (those determining what is seen) and *the watched* (those managing how they are seen). He has extensive experience of using qualitative and mixed methods, thanks to his groundbreaking ESRC-funded ethnography of surveillance camera operators in the UK and his current research on the subjective experience of tracking cultures (Smith, 2015; 2016; 2018; Lupton and Smith, 2018). The former project provided him with a solid foundation for analysing CCTV monitoring and urban governance in a western context, which is a central pillar of the proposed research. CI Smith’s studies of how risk is situationally assessed by surveillance workers, be they human or mechanical, will contribute to the project’s analysis of how facial recognition technology determines organisational decision-making, and intermediates the experience of urban citizenship. In the course of Smith’s duties as a senior researcher and as Deputy Head of Sociology, he has considerable experience in training and supervising research students and postdoctoral fellows, as well as mentoring early career faculty. He has extensive international networks in the proposed area of study, as a result of his research collaborations on various SSHRC grants and organising international conferences, as well as editing the journal, *Surveillance & Society*, for five years. He is also collaborating with CSIRO on a project exploring data markets in the smart city. Great.

CI Gu is an international expert on the development of cultural and media infrastructures in Chinese cities thanks to her research on creative clusters, soft infrastructures and new media. She was recently appointed as a named expert for the UNESCO 2019-2022 facility focusing on digitalization in creative industries and sustainable development in Asia. She will play a key role in considering the issues for cultural policy and civic life raised by the reconfiguration of publicity associated with facial recognition technology. Her work focuses on the cultural changes resulting from digital technologies in cities, in particular, the exploitation of media labour and the development of media cities driven by urban developments (ARC DP 170104255). This project is highly relevant to her research on the ethical and regulatory issues in China’s digital media sector. She will provide a crucial contribution to theorizing the role played by digital monitoring in the urban environment. She has conducted pioneering work on the impact of large urban screens (ARC LP0989302), such as those deployed by the Chinese Social Credit system, and ethical issues in the implementation of new digital technologies. Gu has significant track record in building international

linkages and field research. She brokered industry contacts in China for her past and current ARC projects (in four ARC DPs and LPs including this application). The links she developed within those Chinese media empires that are early adopters of facial recognition technology, such as *Tencent*, *Baidu* and *BeizTV*, will be central to the success of the proposed research. Gu specializes in research using participant observation and ethnomethodology. She will take a leading role in the interviews with tech companies in China and contribute to the design of the survey instruments, bringing to bear her knowledge of the language and cultural context. Gu is supervising a PhD student as part of her current ARC DP and has brought many HDR student projects to successful completion. Gu will complete her current ARC DP by the end of 2019 and will have the time and capacity to undertake this new project in 2020.

PI Conor Roche has over 15 years' experience researching and consulting in the technology and creative sectors across Asia, Europe and North America. Based out of China and Hong Kong for the past seven years, he has advised governments, universities and businesses on China's digital and creative sectors. As a computer scientist, he understands the unique technical conditions of working in China as well as the regulatory and social conditions. He has developed a four-year strategy for the UK's Research and Innovation agency to support a China-UK creative and technology R&D funding programme. This work involved working with industry, academia, and government and funding bodies across both countries. A significant component of this work involved analysing China's artificial intelligence industrial strategy and exploring commercial, regulatory and research opportunities in that area. All of this work has involved designing and delivering a programme of research, managing a team of researchers and consultants and carrying out industrial, academic and government consultations. He is currently the director of BOP Consulting in China, and responsible for establishing and growing the firm's Chinese operation. He was selected for the Council for the US and Italian Young Leaders Program 2015 and awarded a Nesta Fellowship as part of the Clore Leadership Programme 2012. He will play a crucial role in researching the facial recognition sector in China, in making industry contacts, and conducting interviews in China.

PROPOSED PROJECT QUALITY AND INNOVATION

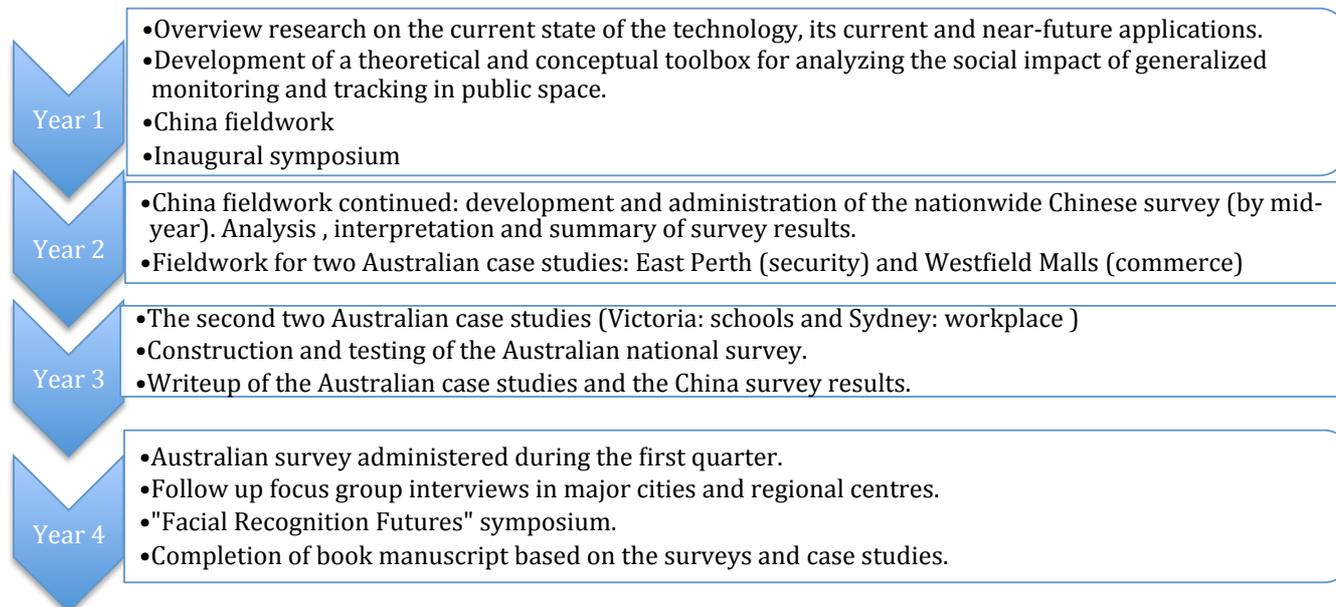
Facial recognition systems will have wide-reaching social consequences that have not received the scrutiny needed to keep pace with the implementation of the technology. Realizing the anticipated benefits of convenience, commerce, and security requires public acceptance of smart cameras, and thus an ongoing engagement with public attitudes and concerns. Any attempt to deploy generalized monitoring without taking into account the societal consequences and level of public concern is likely to face widespread suspicion and resistance. The proposed research would contribute to ensuring that the technology's deployment is shaped by Australian values and democratic commitments. It would be the first to combine an overview of the current use of the technology in Australia with a national online survey of key issues and concerns. The project will frame the Australian context against the background of developments in China, which is pioneering the technology and its uses.

The proposed research contributes to the Government's Science and Research priorities in the area of cybersecurity, particularly with respect to understanding the social factors informing attitudes toward an emerging technology that has a key role to play in cybersecurity, because of the use of biometrics, including facial recognition systems, for securing government facilities, workplaces, and economic transactions. An understanding of public attitudes toward these systems has a crucial role to play in reaping the security benefits of the technology by ensuring it is implemented in ways that foster public support and trust.

The development and use of facial recognition technology is being pioneered, in large part, in China, a fact that provides important context for any study of the social issues raised by its current and future implementation in Australia. China's investment in facial recognition technology (and the underlying forms of machine learning that enable it), combined with a social system that enables the rollout of government monitoring on a mass scale, place it at the forefront of a dramatic transformation in how automated identification functions in daily life. Now is the time to plan for these changes, and China is the place to look to for a sense of what they will be. Although the cultural context contrasts with that of Australia in important ways, the example of China provides insight into the capabilities and uses of the technology. The project will draw on the Chinese context to explore the most advanced current state of the technology with an eye to considering future applications in Australia. The potential for future international collaboration based around this work is strong thanks to CI Andrejevic and CI Smith's association with the Surveillance & Society research network and CI Andrejevic's role as a collaborator on the Canadian Big Data and Surveillance Project, as well as through CI Gu's UNESCO network and her colleagues at Shanghai Jiao Tong University (where she runs an annual summer school). The creation of international facial recognition databases by platforms like Facebook and Amazon will highlight the need for global collaboration on research of this kind.

The project will develop over four years in the following stages:

Project Timeline



Detailed project description: The research schedule is set up to allow the overview research and the China fieldwork inform the surveys, with the Chinese portion of the survey research preceding the Australian survey and focus groups. This goal is to ensure that the background and context research informs the Australian case studies, survey, and interviews. The four CIs will collaborate on developing theoretical approaches, synthesizing background research and writing up research findings, with each CI taking the lead in his or her area of expertise. With respect to the four focus areas, CI Andrejevic will take the lead on the ‘commerce’ case study, CI Gu on the workplace/labour case study; CI Selwyn on the education case study, and CI Smith on the school case study. The overall project thus includes the following components:

A. Background research and concept building.

The concept-building portion of the research brings together scholars, public officials, civil rights groups, and industry representatives for an inaugural symposium on facial recognition technology and mass-customized monitoring. The goal of the symposium is to present and discuss conceptual tools for keeping up with the changed information landscape and addressing contemporary and future applications of the technology and the social issues these raise. This symposium will serve as the basis for an edited collection on facial recognition technology and society. It will provide a foundation and framework for subsequent empirical work, including interviews and the construction of the national surveys. It will also help build a network of potential future collaborators on the topic of facial recognition technology -- and biometric monitoring more generally.

In addition to the symposium, the research team will devote part of the first year to developing an overview of the contemporary and projected future applications of facial recognition technology in China and Australia. This will entail interviews with facial recognition companies in China and Australia and a visit to the annual International Face Performance Conference in the US (Maryland). It will also include a survey of the academic and popular media coverage of facial recognition technology with an emphasis on the social and cultural implications of the technology. This will result in a literature review that will inform the development of the survey instruments for both countries by identifying key areas of development of the technology and important areas of social benefit and concern. The goal of the theory-building portion of the project will be to develop a conceptual toolbox for analyzing the societal impact of facial recognition including key areas of public benefit as well as the potential issues it raises with respect to questions of privacy, civil rights, accountability, and governance. This approach will build on the work of CIs who have pioneered approaches to the political economy of surveillance (Andrejevic’s writings on the work of being watched) and Smith’s work on CCTV monitoring systems, Selwyn’s work on digital media in everyday life, and Gu’s work on digital labour. It will update and modify these approaches to consider the societal impact of the generalization of facial recognition technology for commerce, security, work, and education.

B. The Chinese Context

China has an important contextual role to play in this project because the technology it is developing is already being incorporated into Australian “smart” CCTV systems. The Chinese portion of the study has the following components:

1. An overview of the contemporary deployment of facial recognition technology in China. Partner Investigator Conor Roche, who is based in Shanghai, will facilitate the interviews, which will be led by CI Gu. PI Roche (along with other China contacts) has identified practical challenges to speaking with local and municipal officials and in conducting research involving members of the public in these contexts. Instead, this project will focus attention on

documentary evidence -- including media coverage –trade shows, and industry interviews. Team members will also conduct site visits to three cities that have implemented facial recognition systems linked to the Social Credit System: **Beijing, Shanghai, and Zhengzhou** (where police have coupled facial recognition technology with both CCTV cameras and glasses worn by police officers) and conduct interviews with representatives from the companies that are taking the lead in developing facial recognition technology in China, including: **Hikvision** (in Hangzhou), **Yitu** (Shanghai), **SenseTime** (Beijing), **Eyecool** (Beijing), **Dahua** (Hangzhou), and **Megvii** (Beijing). We will interview officials from the main companies involved in developing the technology in Australia. A preliminary list includes the following: **Hikvision Australia** (offices in Sydney and Melbourne), **LoopLearn** (Melbourne), **Noahface** (Sydney), **Imagus** (Brisbane).

2. A nationwide online survey of the Chinese public's experience with and attitudes toward facial recognition systems in public locations. The survey will be administered by Daxue Consulting research, which has experience administering online surveys via mobile phones and computers in China. The survey will be designed in consultation with Daxue (which will help craft questions to avoid firewalling) and will draw upon background research on contemporary and future uses of facial recognition technology to cover attitudes toward the use of the technology in four contexts public safety and security, commerce (marketing and retail), education, and the workplace. The survey will be administered to 2,000 respondents, representative by age (over 18), gender, and location (region and city tier). Specific questions will take shape based on the research findings, but the theme areas for the survey will include:

- Basic demographic information
- Knowledge/Awareness of facial recognition system use in China
- Direct experience with facial recognition systems (in school, workplace, etc.)
- Attitudes toward the use of facial recognition for public safety, commerce, education, employee monitoring.
- Attitudes toward projected future uses of the technology (these will be determined based on the trade show visits and interviews with representatives of technology firms).

C. Facial Recognition Case Studies in Australia.

Building on the state of the technology overview, the research team will conduct case studies of the use of facial recognition in each of the following contexts: commerce/retail; security; the workplace; and schools. The case studies will provide concrete examples of existing uses of the technology in order to provide a sense of its contemporary capability and to situate claims about future uses of the technology in context. The interview themes for the case studies will be shaped by the conceptual foundations developed during the course of the literature review and the inaugural symposium. Each case study will include:

1. A review of the popular press coverage, including the social media response to the technology.
2. Interviews (one-on-one) with those overseeing the implementation and use of the technology. Topics to be covered include: reasons and aspirations for implementation, potential limitations of and concerns; future directions; regulatory concerns.
3. Targeted interviews with those affected by the technology (small group interviews: 2-5 participants), covering benefits and advantages; attitudes toward capture and use of personal information; potential concerns; regulatory priorities. In each case we will recruit volunteers from the population subject to the targeting. This will be convenience sampling based on availability and willingness. In the workplace we will interview employees, in the schools, students and parents, in the mall, shoppers, and in East Perth, local residents.
4. Interviews with representatives from the companies that develop and provide the technology. Topics to be covered include: current capabilities (and limitations) and future directions; response to public concern; perceived benefits; response to public attitudes and concerns.

Case studies and interview locations in Australia:

Year 2:

Commerce/retail (Sydney): Westfield Shopping Centres (in Melbourne, Sydney, and Brisbane). Westfield has been an early adopter of the technology, though at this point they say they are not matching faces with an identifying database, but merely using the technology to identify general characteristics (specifically: age, gender, and mood). The use of detection technology represent an important development, as mood tracking is likely to be implemented on top of identification systems in many cases. **Led by CI Andrejevic.**

Security (Perth): As part of its smart city program, East Perth is installing 30 CCTV cameras equipped with facial recognition technology. This is a pilot program that, if successful, could lead to the rest of the city's cameras being upgraded to include facial recognition. The primary purpose of the technology is security and public safety. We will interview residents, police, city officials, and privacy advocates about the East Perth program. **Led by CI Smith.**

Year 3:

Workplace (Sydney): Several Australian companies have implemented facial recognition systems to track employers and clock them in and out of working shifts. We will approach these companies to learn about the experience of both supervisors and employees. Companies we approach include: **Rhino Rack (NSW)** and **Canberra Airport**, which both use the technology for work time and attendance monitoring. **Led by CI Gu.**

Schools: (Geelong, Ballarat): Ballarat Clarendon College and Sacred Heart College in Geelong, VIC. These are two of the schools that have received media coverage for trialing the facial recognition systems created by the tech startup, **LoopLearn**. A press release from Sacred Heart College suggestively described the system as part of a more flexible approach to the learning environment: “The program is based on student facial recognition and can determine a student’s whereabouts on campus at any given time. As well as providing a high level of security and safety for our girls, it also saves a good deal of time in that teachers won’t need to manually mark the attendance role before every class. As we move towards more ‘self-directed learning’ at SHC our students won’t always be in a classroom.” **Led by CI Selwyn.**

D. Australian National Survey

The culminating piece of empirical research for the study will be a national survey using WhereTo’s national survey panel. The goal of the survey will be to assess public understanding of and attitudes toward the use of facial recognition technology in public contexts. Based on the expertise developed by the research team over the course of the first two years of the project, the survey will also assess public response to proposed principles for regulating the use of facial recognition technology in public contexts. The survey will be based on a nationwide sample of 2,000 Australians. The sample will be stratified to be representative of the overall population by gender, age (over 18), and geography. The survey will also be designed to reflect developments in the technology and its deployment over the first two years of the study. The questions will be designed by the research team in response to the conceptual work and the theoretical findings of the first two years. It will also incorporate questions that align with the China survey in order to compare attitudes toward facial recognition technology across the two countries. These differences provide a useful point of analysis in considering the way in which technologies developed in one national context are being used and deployed in a very different one. In other words, it will be useful, from the Australian perspective, to understand the cultural contexts within which the technology upon which it relies has been developed.

Theme areas for the national survey include the following:

- Basic demographic information
- Knowledge/Awareness of facial recognition system use in Australia
- Direct experience with facial recognition systems (in school, workplace, etc.)
- Attitudes toward the use of facial recognition in the following contexts: public safety, commerce, education, and the workplace.
- Attitudes toward projected future uses of the technology (these will be determined based on the trade show visits and interviews with representatives of technology firms).
- Preferences regarding regulatory priorities in each of the covered contexts (public safety, commerce, education, and employee monitoring).

E. Overview assessment of future trends/issues

Upon completion of the case study research, the national survey, and focus group interviews, the research team will conduct **interviews with policy-makers, urban planners, advocacy groups (including the Australian Privacy Foundation, Electronic Frontiers Australia and international representatives of the Electronic Privacy Information Center and Privacy International) and state and federal information and privacy commissioners** on the use and regulation of facial recognition technology. The team will also conduct **18 focus group interviews** (5-8 people) in urban and regional Australia, bringing together people from a range of demographic backgrounds to consider the use of facial recognition technology in schools, the workplace, retail outlets, and public space to discuss and contextualize the survey results.

FEASIBILITY

The project brings together an interdisciplinary team with a shared set of questions about a crucial social problem. How do we anticipate and regulate a monitoring technology that will change our social institutions and behaviours? The project is designed to develop both a conceptual framework for approaching these questions and to conduct groundbreaking empirical research on public attitudes and concerns about this new technology. Because of the challenges associated with research involving government institutions (including law enforcement, public employees, and schools) in China, the comparative aspect of the study relies primarily on online surveys. The

company we have chosen has a proven track record in China and was referred to us by a colleague in the field. Similarly, CI Selwyn has done work in the past with the research company that would administer the Australian survey. We have two investigators who will play central roles in setting up and conducting the China portion of the research.

CI Gu has a well developed network of contacts in China because of her past work on creative industries and maker spaces in the country. She is also a native Mandarin speaker and will take the lead in the interviews, some of which will be conducted in Chinese (depending on the comfort level of the industry representative). PI Roche is based in a Shanghai consulting company and will assist in organizing trade show visits and in assembling contact information for the Chinese tech companies.

The Chinese site visits to cities implementing facial-recognition technology as part of the social credit system will be primarily observational, given the restrictions on academic research on members of the public in China. These will be incorporated into the interview trips. The Australian case studies will include a range of interviews and will typically take three to four days on site. Each visit will require advance preparation in terms of making contacts, scheduling visits, ensuring clearance for interviews, and so on. The 0.6 Research Assistant will play a crucial role in organising background research, assembling literature reviews, coordinating events and trips, setting up focus group interviews, and coordinating the co-authoring process. All of the CIs have experience conducting site interviews and doing content analysis. In the case of the Australia visits, the preparatory work will be guided by the CIs and conducted by the RA.

The research team already has strong connections that will assist in the first-stage work of concept building. CIs Andrejevic and Gu have been in conversation for the past two years on issues of monitoring and urban space, and CI Gu participated in a symposium on smart cities co-organized by CI Andrejevic. CIs Andrejevic and Smith have been in conversation over the past five years on issues of monitoring and surveillance, and worked together on a research symposium at ANU on automated monitoring systems. Each of the CIs has expertise that supports the four selected application areas for facial recognition technology. CI Andrejevic has done groundbreaking work on automated surveillance in commerce and marketing, and has played an influential role in the literature on the political economy of digital surveillance. CI Selwyn has conducted extensive, high-profile research on technology in the schools. CI Smith has written a groundbreaking book on the use of CCTV in policing, and CI Gu has expertise in theories of urbanism, public space, and digital media. What unites the group beyond a shared interest in the topic is a common conceptual vocabulary and a set of concerns about the societal issues raised by automated monitoring systems. It is a group well positioned to collect interesting and timely empirical data about the technology and to collaborate effectively on building a conceptual and theoretical framework based on these findings.

Monash University has recently made a substantial investment in research on digital media and data science, providing a supportive research environment for the project. The School of Media, Film and Journalism has built strength in the area thanks to three new hires working on digital media technology. Additionally, the Digital Cultures Working Group in the Faculty of Arts will serve as a sounding board for presentations of research findings, and SensiLab and the Emerging Technology Lab will both serve as useful resources for the team as they explore new developments in facial recognition technology.

The School has a Media Lab with high quality sound recording and equipment to facilitate processing the interviews and to serve as a site for interviews with locally based sources. CI Andrejevic leads Monash's Focus Program in Culture, Media, and Economy, which will serve as another site for presenting findings and receiving feedback. We anticipate that the work started by the project will serve as a foundation for future research in the area that brings together recent hires in the School with existing expertise in the Digital Cultures group and the University's new AI and Data Science Institute, currently in development.

BENEFIT

The question of how to incorporate smart cameras into Australian society will become a real and pressing one in coming years. The potential benefits to deploying the technology are myriad: more efficient and secure transactions, greater accountability, enhanced public safety and security, improved economic productivity, and commercial services. In a democratic society, however, there are additional imperatives including accountability, civil rights, and limitations on the concentration of power. Good. **The proposed research provides important resources for addressing the question of how to ensure the technology is developed and implemented in ways that accord with Australian values and commitments.** One of the challenges that societies in the midst of rapid technological change face is keeping up conceptually, culturally, and practically with the new technological affordances. This project combines basic theory building with empirical research to develop the conceptual vocabulary needed to anticipate, discuss, and understand impending technological developments. Concrete benefits of the program include:

- a) The creation of a conceptual framework for understanding the ways in which facial recognition technology transforms monitoring practices and strategies, reconfiguring expectations of privacy and/or anonymity in a range of social contexts, and generating new types of data profiles.
- b) An overview of the state of facial recognition implementation in Australia and an expert assessment of likely future trends and issues, including potential benefits and concerns.
- c) The benefits of a comparative study of the implementation of the technology that places the Australian case studies within the broader context of the capabilities being implemented by the global leader in the development and use of automated facial recognition.
- d) The first representative study of public attitudes toward the use of the technology and priorities for its use and regulation.
- e) The first overview of principles for the implementation of facial recognition technology that combines input from a range of stakeholders including public officials, educators, public advocacy groups, employers, tech companies, and researchers. This will provide a foundational resource for forthcoming public and policy discussions regarding the implementation and regulation of facial recognition technology.
- f) Capacity building in an area that will become increasingly important as the technology becomes more powerful, effective, and widespread.

COMMUNICATION OF RESULTS

Each phase of the project will generate results that will be disseminated in appropriate forms for academic audiences, the public, and policy makers. The inaugural **symposium** proposes a pioneering investigation of concepts and theoretical frameworks for addressing the social and cultural consequences of facial recognition technology in public spaces (understood as places accessible to the public and not just publicly owned spaces). The results of the symposium, which will feature contributions from leading scholars in the fields of digital media studies, surveillance studies, urban design, and law, include an **edited collection**. This phase will also include a co-authored journal article outlining the key issues raised by the reconfiguration of our understanding of public space in an era of facial recognition technology.

The **Chinese survey results will be made available online** and will also form the basis for a **co-authored journal article** that places the findings in the context of broader cultural research on attitudes toward questions of privacy, publicity, and monitoring in China. The journal article will assess the extent to which the survey findings are consistent with existing research on privacy and surveillance in China. It will also approach the broader question of the attitudes and responses that align themselves with supporting or disapproving of the deployment of mass facial recognition capabilities.

The **Australian survey results will be published online**, made available to media outlets in the form of a press release, and presented to regulatory bodies and agencies in the form of a white paper. They will also be incorporated into an **academic journal article** that relates conceptual approaches with regulatory proposals for the deployment of the technology in accordance with Australian values and commitments.

The **Australian case studies will generate a co-authored set of journal articles** (one on security, one on commerce, and one on the workplace) that contributes to developing a framework for considering the strategies and logics that span the diverse uses of facial recognition technology in Australia. Research on the case studies will also serve as the basis for international conference presentations at the Association of Internet Researchers, the International Communication Association and the Biannual Surveillance and Society Conference.

The focus group interviews will be combined with findings from the background research and the national surveys to form the basis of a **co-authored book-length summary report** that identifies key trends and issues regarding the deployment of facial recognition technology in Australia. The report will draw on the China case studies and interviews to provide an assessment of the future capabilities and possible uses of the technology. It will also incorporate interviews with consumer advocates, privacy groups (The Australian Privacy Foundation; Electronic Frontiers Australia), urban planners, and state and federal information and privacy commissioners. Sections of the report will be made available in draft form through the project Web site. The final version will be published in book form and publicized through public presentations and summary reports with the goal of providing the public, policy makers, educators, and academics with information to help shape public deliberation over how best to implement the technology in accordance with commitments to democracy, accountability, and civil rights.

Management of Data: The project will manage three data types: (1) interview data; (2) survey data; (3) documentary data. The project's data management for all these data types will be in line with the Australian Code for the Responsible Conduct of Research (2007) and Monash University's Research Data Management Policy. All research corpora that we work with will be covered by approval from the Monash University Human Research Ethics Committee (MUHREC). Interview and survey data will be stored either in locked file cabinets or on password-protected computers, and the results of all interviews and surveys will be anonymized.

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