Submission to the House of Commons Standing Committee on Access to Information, Privacy and Ethics for the Study on the Use and Impact of Facial Recognition Technology

Submitted by:

AGE-WELL NCE Inc. & CanAge

September 2021

PURPOSE

AGE-WELL, Canada's Technology and Aging Network, and CanAge, Canada's National Seniors' Advocacy Organization**,** welcome the opportunity to contribute to the Standing Committee on Access to Information, Privacy and Ethics' study on the use and impact of facial recognition technology. The purpose of this briefing is to highlight the valuable role that facial recognition technology (FRT) can play in helping to improve the lives of older adults and the need for regulation that ensures ethical and privacy rights are upheld, while continuing to enable the use of FRT for societal good.

RECOMMENDATIONS

1. We recommend that as Canada continues to modernize its privacy laws, that clear distinctions between types of technology that utilizes biometric data are made to ensure effective governing of these technologies, based on a common language.
2. We recommend that adjustments be made to Bill C-11 to bolster the knowledge and consent requirements for the use of FRT, including the addition of explicit definitions of consent that ensure people with disabilities, including people living with dementia, are meaningfully accounted for, and that their consent rights are upheld.

BACKGROUND

The use of FRT has become increasingly present in society in a variety of sectors, including law enforcement, business marketing, border control, and healthcare; and its ubiquitous use has raised several ethical and privacy concerns, as well as concern over lack of effective governing legislation.[i] FRT has been employed for several diverse uses including:

- to search for suspects in investigations;
- track and target marketing to customers in commercial and online spaces;
- grant access to certain locations, such as entry onto public transportation; and
- in border control to verify identities.

FRT has also saturated daily lives through individual tasks like unlocking smartphones and online authentication. Current challenges associated with FRT include infringement on civil liberties, biased and discriminatory data that can lead to misidentification, and privacy and surveillance concerns when the technology is used in a covert way.[ii] FRT, however, carries great opportunity to be used for socially beneficial purposes, and in a way that mitigates privacy infringements when implemented and governed properly.

DISCUSSION

Terminology & Distinctions

The terms associated with biometric technologies are often used interchangeably, however, there are key distinctions between them. Ensuring that terms are well defined and distinctly understood will be vital to the effective and implementation of legislation governing them.

1. **Biometric Technology (BT)**
   Biometric technology encompasses all technology that utilizes biometric data or systems, which can "identify or verify the identity or a claim of persons on the basis of the automated measurement and analysis of their biological (such as fingerprints, face, and iris) or behavioral (such as signature and voice) characteristics".[iii] Other biometrics include walking style/gait, DNA segments, ear shape, vein patterns, and hand geometry.[iv]

2. **Facial Detection Technology (FDT)**
   Facial detection technology is an "AI-based computer technology that is used to extract and identify human faces from digital images".[v] This technology can detect the presence of a human face by using algorithms developed through large data sets of images; however, FDT does not match the detection of a face to the identification of an individual and specific person. Although, facial detection can also be used to detect other characteristics such as gender and age of a person, as well as emotions.[vi]

3. **Facial Recognition Technology (FRT)**
   Facial recognition is a type of biometric technology that utilizes FDT algorithms to detect a human face and subsequently match detected faces with the identification of an individual person based on their facial geometry, using large databases of faces.[vii] An important divergent characteristic of FRT is that it can be used without explicit consent, and from a distance of the subject, in contrast to other types of biometrics, such as thumbprints, that inherently require physical contact with the technology.[viii]

Value of Facial Recognition Technology for Pain Detection

AGE-WELL is working to move the dial in eight key areas related to healthy aging, known as our challenge areas. One of these areas in particular, Cognitive Health and Dementia, can benefit greatly from the proper and safe use of FDT and FRT. A current AGE-WELL project is researching how this type of technology can improve the lives of older Canadians living with severe dementia. Researchers based in Saskatchewan and Ontario are developing tools to enhance pain detection among residents of long-term care (LTC) homes. Unaddressed pain among residents with dementia in LTC facilities is a prevalent issue, with studies demonstrating that these residents are less likely to receive appropriate pain relief medication than other residents. Often, people with dementia are unable to verbally express their pain, and this leads to undesirable behaviour and inappropriate treatment. Shortages in LTC staffing exacerbates this issue, as workers often do not have time to perform the in-depth assessments needed to detect uncommunicated pain. The results of under-addressed pain among residents with dementia are that residents can become aggressive. This aggression is often misdiagnosed and leads to over prescribing of inappropriate medications, such as psychotropics. [ix]

This project is working on an innovative solution to address these unacceptable outcomes by developing technological tools to detect pain through expressional cues and subsequently alert LTC staff. Currently, these technologies will operate on a facial detection basis, meaning they will not store information that can connect features to a person; rather, will simply use detection of human facial features to identify if pain is present in an individual while they are in their room. Furthermore, video footage will not be stored—only the alert that pain has been detected, and who needs a further assessment will be saved. The data used in this type of FDT is a repository of video frames of non-verbal pain expressions that researchers catalogued by manually coding nuanced facial expressions to feelings of pain. A later stage of the project would see the implementation of FRT to allow for pain detection of individual residents regardless of where they were in the home. This project demonstrates the power of technology in ensuring high quality of life for those living with dementia, how technology can complement in-person caregiving, and how FRT can revolutionize the assessment of pain in LTC facilities.

Other Socially Beneficial Uses of Facial Recognition and Detection Technology

Beyond pain detection, there are other innovations employing biometric technologies that have good potential to contribute to our well-being. Examples include smart home door locks, which can use FRT to unlock doors to homeowners, caregivers, and friends and voice assistants that recognize a user's emotions through their speech and adjust their responses accordingly.[x] Recognizing emotions using facial detection technology to adjust a product or service is a similar area of innovation. Detecting emotions to assist in e-therapy;[xi] to inform recommender services for entertainment;[xii] and to customize sleep aid systems[xiii] are all projects in various stages of study and implementation in organizations throughout the country and the world. Face detection technology is also currently integrated into a tool to assist clinicians in diagnosing genetic syndromes. There is some evidence that this tool provides faster and more accurate diagnoses than traditional methods. It also has the potential to provide more equitable access to diagnosis across geographical distances.[xiv] Analyzing facial features is also showing promise in detecting other conditions, such as sepsis.[xv]

Ethical Considerations & Privacy Issues

On a broader scale, one of the most salient issues related to the FRT is constant and mass surveillance of the public. Concerns related to public surveillance are less present in the deployment of FRT for individual uses discussed above, such as for pain detection and smart door locks; however, there remains several other ethical considerations that need to be taken into account—most notably, around consent, privacy, and data protection. Ensuring that users of this technology have provided their free and informed consent will be imperative to its ethical use. This will be particularly sensitive in cases where the user is a person living with dementia. Best practices developed for participation of people living with dementia in research can provide guidance here. Ensuring the highest standard of meaningful consent requires adjustments to Bill C-11, mainly regarding the definition of consent and the listed exceptions to consent,[xvi] as well as with the inclusion of language that supports meaningful consent from people with disabilities, including those living with dementia. Furthermore, ensuring robust data security and protection will also be vital to the use of this technology, especially as the demand for this type of personally identifying biometric data rises. If these considerations can be properly accounted for and concerns mitigated using regulation, there exists great potential for FRT, and other biometric technologies, to contribute to the social good in powerful ways.

About AGE-WELL

AGE-WELL is a pan-Canadian network that brings together researchers, older adults, caregivers, partner organizations, and future leaders to accelerate the delivery of technology-based solutions that make a meaningful difference in the lives of Canadians. AGE-WELL researchers are producing technologies, services, policies, and practices that improve quality of life for older adults and caregivers and generate social and economic benefits for Canada.

About CanAge

CanAge is Canada's national seniors' advocacy organization, working to improve the lives of older adults through advocacy, policy, and community engagement. CanAge is non-partisan and backed by a pan-Canadian membership base. To learn more about CanAge and issues critical to Canadian seniors, please see VOICES: A Roadmap to an Age-Inclusive Canada.

[i] Richardson, R. (2021, February). *Facial Recognition in the Public Sector: The Policy Landscape*. GMF. https://www.gmfus.org/sites/default/files/Richardson%20-%20Facial%20recognition.pdf

[ii] Ibid.

[iii] Kindt, E. J. (2013). Privacy and Data Protection Issues of Biometric Applications: A Comparative Legal Analysis (1st ed.). *Springer Netherlands*. https://doi.org/10.1007/978-94-007-7522-0

[iv] Biometrics Institute. (n.d.). *Types of Biometrics*. https://www.biometricsinstitute.org/what-is-biometrics/types-of-biometrics/

[v] RecFaces. (2021, January 13). *Face Detection: What Is It and How Does This Tech Work?* https://recfaces.com/articles/what-is-face-detection

[vi] Research Group of the Office of the Privacy Commissioner of Canada. (2013). *Automated Facial Recognition in the Public and Private Sectors*. https://www.priv.gc.ca/en/opc-actions-and-decisions/research/explore-privacy-research/2013/fr_201303/

[vii] Ibid.

[viii] Eaves, D. & N. Rashid. (2020, February 25). *Facial recognition technology requires checks and balances*. Policy Options. https://policyoptions.irpp.org/magazines/february-2020/facial-recognition-technology-requires-checks-and-balances/

[ix] AGE-WELL. (n.d). *AGE-WELL Project 6.3: PAIN-ASSESS – Development, Implementation and Evaluation of an Automated Pain Detection System for Older Adults with Dementia*. https://agewell-nce.ca/archives/3587

[x] Chatterjee, R., Mazumdar, S., Sherratt, R. S., Halder, R., Maitra, T., & Giri, D. (2021). Real-Time Speech Emotion Analysis for Smart Home Assistants. *IEEE Transactions on Consumer Electronics*, *67*(1), 68–76. https://doi.org/10.1109/TCE.2021.3056421

[xi] Uzor, G. G. G., & Vadapalli, H. B. (2020). *Smartening E-therapy using Facial Expressions and Deep Learning*. 2020 2nd International Multidisciplinary Information Technology and Engineering Conference (IMITEC), 1–8. https://doi.org/10.1109/IMITEC50163.2020.9334115

[xii] De Pessemier, T., Coppens, I., & Martens, L. (2020). Evaluating facial recognition services as interaction technique for recommender systems. *Multimedia Tools and Applications*, *79*(31-32), 23547–23570. https://doi.org/10.1007/s11042-020-09061-8

[xiii] Zhao, X., Li, J., Liu, W., Zhang, J., & Li, Y. (2020). Design of the sleeping aid system based on face recognition. *Ad Hoc Networks*, 99. https://doi.org/10.1016/j.adhoc.2019.102070

[xiv] Gurovich, Y., Hanani, Y., Bar, O., Nadav, G., Fleischer, N., Gelbman, D., Basel-Salmon, L., Krawitz, P. M., Kamphausen, S. B., Zenker, M., Bird, L. M., & Gripp, K. W. (2019). Identifying facial phenotypes of genetic disorders using deep learning. *Nature Medicine*, *25*(1), 60–64. https://doi.org/10.1038/s41591-018-0279-0

[xv] Forte, C., Voinea, A., Chichirau, M., Yeshmagambetova, G., Albrecht, L. M., Erfurt, C., Freundt, L. A., Carmo, L. O. e, Henning, R. H., van der Horst, I. C. C., Sundelin, T., Wiering, M. A., Axelsson, J., & Epema, A. H. (2021). Deep Learning for Identification of Acute Illness and Facial Cues of Illness. *Frontiers in Medicine,* 8, 661309. https://doi.org/10.3389/fmed.2021.661309

[xvi] Austin, Lisa. (2020, December 22). *Who decides? Consent, meaningful choices, and accountability*. University of Toronto. https://srinstitute.utoronto.ca/news/austin-consent-meaningful-choice-accountability