EXPRESSION OF INTEREST

My name is Tram Tran. I am a third-year PhD student in the Urban Interfaces Lab at the University of Sydney's School of Architecture, Design and Planning. I am interested in smart cities and emerging technologies (e.g., AR/VR). My PhD research investigates the interaction between pedestrians and autonomous vehicles, with a focus on complex traffic scenarios of multiple road users.

Autonomous vehicles can be considered a type of robot, and in this regard may follow *The Three Laws* proffered by Isaac Asimov:

1. A robot may not injure a human being or, through inaction, allow a human being to come to harm,
2. A robot must obey the orders given to it by human beings except where such orders would conflict with the First Law,
3. A robot must protect its own existence as long as such protection does not conflict with the First or Second Law.

Nevertheless, if an AI driving system was programmed to always yield to pedestrians, it could easily result in traffic congestion and undermine its own values in the transportation system. Therefore, human factor researchers should consider and investigate ways to foster a collaborative relationship between pedestrians and autonomous vehicles, ensuring both pedestrian safety and traffic efficiency. For example, external communication of autonomous vehicles (e.g. via a LED display attached to the vehicle's bumper) is a growing research venue in recent years. The external interfaces compensate for the absence of drivers' cues and allow for transparency of intentions, which is a quality desired in almost every intelligent system (Zileli et al., 2019). Their presence significantly lowers the decision time (Holländer et al., 2019), and positively influences multiple subjective measures such as trust, acceptance, user experience, and perceived safety (Faas et al., 2020).

Attending the workshop "Empowering People in Human-Robot Collaboration: Bringing Together and Synthesising Perspectives", I hope to learn about related research projects and gain a new perspective to incorporate into my future work.

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Holländer, K., Colley, A., Mai, C., Häkkilä, J., Alt, F., & Pfleging, B. (2019). Investigating the influence of external car displays on pedestrians' crossing behaviour in virtual reality. *Proceedings of the 21st International Conference on Human-Computer Interaction with Mobile Devices and Services*, 1–11.

Faas, S. M., Kao, A. C., & Baumann, M. (2020). A Longitudinal Video Study on Communicating Status and Intent for Self-Driving Vehicle--Pedestrian Interaction. *Proceedings of the 2020 CHI Conference on Human Factors in Computing Systems*, 1–14.

Zileli, S., Boyd Davis, S., & Wu, J. (2019). Towards transparency between the autonomous vehicle and the pedestrian. *Design and Semantics of Form and Movement, DesForm 2019: Beyond Intelligence*, 96–104.