Research project and supervisory team

Supervisory Team	• Boon Giin Lee • Matthew Pike • David Chieng
Short introduction & description of research project	Firefighting is an inherently dangerous occupation. Current technologies used by firefighters could be considered primitive, when compared to the technological advancements we've witnessed in other fields of work. In this research, we will design and develop a smart firefighting operations system (SFOS) for use in real firefighting situations. The SFOS will utilize data from several sensors embedded into a firefighter's Personal Protective Equipment (PPE) and other firefighting equipment. Using wireless communications networks, data from these sensors and equipment will be integrated and processed using intelligent algorithms. These algorithms will produce a dynamic safety and risk assessment of the fire scene, enabling firefighters to obtain a better sense of the dangers and potential route for traversing the fire scene. SFOS will also enable the modelling of the indoor environment using non-vision-based localization and mapping techniques, which allow firefighters to 'see through the smoke'. Through the realization of SFOS, we hope to improve the occupational health and safety of firefighters through better coordination and communication between firefighting teams. The key research themes for this project are: • IoT-based Communication Systems for firefighter communications. This work will focus on developing the framework necessary for transmitting wireless data from inside the fire-ground to the outside. In addition to developing the necessary communications capabilities, we will also develop intelligent interference removal techniques for improving the quality of transmitted data. • Virtual reality-based training platform for firefighters. The training platform will support multi-sensory experiences when engaging with avatar characters within the virtual world. This project will explore the factors that inform good multi-sensory interaction experiences in virtual training environments and develop engaging training missions which align with real-world requirements set out by an industrial collaborator
Required Skills	• Experience working with VR headset, such as: Oculus Quest 2; HTC VIVE; Microsoft Hololens etc. • Strong, technical problem-solving ability. • Strong programming experience. • Experience with 3D modelling tools, such as: Unity3D; Maya; 3Ds MAX etc. • Experience embedded system such as Arduino, IMU and BLE.
Contact points	Interested candidates should contact Dr. Boon Giin Lee (boon-giin.lee@nottingham.edu.cn). Please include an up-to-date CV and academic transcripts.