MACQUARIE University

MQ Photonics Research Centre Seminar

Wednesday, 25 August 2021, 2:00 pm
(Zoom link: https://macquarie.zoom.us/j/85829287435)

An NSSN case study - Autonomous detection of whales at sea

Tomonori Hu

NSSN Theme Leader-Environment & AgTech

Abstract: The NSW Smart Sensing Network was set up in 2016 by the NSW Government to bring together smart sensing expertise in academia, industry, and government. I will share my experiences as the NSSN Theme Leader for Environment & Agtech. I will go through a recent case study, developing a sensing system to detect whales at sea. This project aims to develop a system to autonomously detect whales within 3 km from the vessel - causing major disruptions to operations. The project looks to continue to a proof-of-concept stage where the full system will be implemented and explores other applications in areas such as wildlife detection, sea surveillance, and defence.

Speaker biography: Dr Tomonori Hu has a background in physics - developing mid-infrared fiber lasers for applications in spectroscopy. His interests lie in the translation of academic technologies to industry. Since graduating from a PhD at the University of Sydney in 2015, Tom has been involved with commercialisation of his research to form a start-up company - developing mid-infrared spectrometers. Tom has completed accelerator programs such as INCUBATE, and subsequently operated the company from various locations in Sydney. At the same time, he leads a group at the University of Sydney on optical sensor technologies related to air quality, wildlife detection and defence.

Ultraporous Nanoparticle Networks for Superior Light Detection

Noushin Nasiri

Head of NanoTech Laboratory MQ University

Abstract: UV light is known for its harmful effects on human health and it is the major cause of skin cancer due to the mutation in p53 tumour suppressor genes. Therefore, monitoring of UV exposure in sunlight via wearable devices is important in preventing skin cancer. Our team has designed and developed a smart wearable UV detector made of vertically stacked layers of ultraporous nanoparticle networks with outstanding sensitivity to UV radiation. The device is equipped with Bluetooth Low Energy (BLE) communication that consumes low energy and lasts at least one day fully charged. This wearable UV detector is a personalised UV monitoring system which can perform based on real-time data measurements and has a potential to be calibrated based on end-user skin type.

Speaker biography: Dr Noushin Nasiri is the Head of the NanoTech Laboratory at the School of Engineering. She received her PhD on nanomaterials from the Australian National University in 2017, followed by a postdoctoral fellowship at the Institute for Biomedical Materials and Devices (IBMD) at University of Technology Sydney. She joined MQ University in September 2018 to work on design and fabrication of nanostructured materials, miniaturized sensors, and wearable electronics. She is one of Australia's 2021-2022 Superstars of STEM and the recipient of NSW 2019 Young Tall Poppy Science Award.