

Speaker: [Dr Thanh Nho Do](#)

Scientia Fellow, Lecturer
Graduate School of Biomedical Engineering
Faculty of Engineering
University of New South Wales
Sydney



Date: Monday 5 August 2019

Time: 11.00 am

Venue: Room 1.08 QMF building (N74), Griffith University, Nathan Campus

Title: **Robotics in Healthcare: From Capsule Endoscopy, Flexible Surgical Robot, to Soft Haptics**

Abstract:

Gastrointestinal (GI) tract and the accessory organs of digestion are responsible for human death from cancer than any other systems in the human body. Obesity is associated with the increased risk of these cancers, including oesophagus, kidney, and gallbladder. A variety of these diseases are suited to treatments via natural orifice endoluminal procedures. The reduced trauma, scarring, faster recovery rates, and accessibility of these procedures compared to traditional open and laparoscopic surgeries provide tremendous benefits to cancer and obese patients. However, existing robotic systems and treatment methods are unable to meet the complex requirements for conducting successful interventions in these challenging settings, due to limitations in size, payload, flexibility, and lack of sensing components and real-time haptic feedback, all of which constrain their practicality. Haptic or touch feedback plays a vital role in enhancing the human performances and safety in skilled tasks, especially in teleoperated systems. It has been proven to enhance the user's ability to effectively explore the patient's tissues and manipulate surgical tools that are remote in scale and distance. However, current wearable haptic devices that can reproduce the human hand's motion and amplify the human sense of touch are still limited. In this talk, Dr Do will describe latest approaches on the development of flexible surgical robotic systems for gastrointestinal cancer and obesity treatments as well as multifunctional soft sensors and actuators that can amplify the sense of the touch for haptic and tactile displays. Finally, he will discuss the future challenges in these research areas and also propose solutions that can further enhance their practicality in healthcare sector.

Brief Bio:

Dr Thanh Nho Do is currently a Lecturer and Scientia Fellow at Graduate School of Biomedical Engineering (GSBmE), Faculty of Engineering, University of New South Wales (UNSW), Sydney, Australia. He was awarded PhD degree in Mechanical Engineering (Surgical Robotics) from the School of Mechanical & Aerospace Engineering (MAE), Nanyang Technological University (NTU), Singapore. He also received his B.Eng in Manufacturing Engineering (Honor Program) from Ho Chi Minh City University of Technology (HCMUT), Vietnam. He was a postdoctoral scholar at California NanoSystems Institute (CNSI), University of California at Santa Barbara (UCSB), California, USA. He also worked as a Research Fellow at the school of MAE, NTU, Singapore. His main research interests include the development of flexible endoscopic systems, magnetic capsule endoscopy, soft robotics including soft sensors and actuators, organic field effect transistor (OFETs), functional materials, nonlinear modelling and control, and wearable haptic/tactile displays. His works have also attracted substantial media coverages internationally.

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