NUS National University of Singapore | iHealthtech Institute for Health Innovation & Technology

iHealthtech Seminar

26NOV, WED, 2:30 PM –3:30 PM

NUS, College of Design and Engineering, Building E7, Level 3, Seminar Room 4

Dr Ouyang Wei

Assistant Professor of Engineering,
Thayer School of Engineering at Dartmouth College, USA

Towards Better Care for Organs: A Bioresorbable, Programmable Implant for Postoperative Monitoring of Organ Health

Hosted by: Dr Wu Changsheng, iHealthtech Principal Investigator

Complications affecting organ health after surgery, such as ischemic injury, metabolic disturbance, and graft rejection, contribute substantially to postoperative morbidity and mortality. Radiological tests and blood tests, while valuable, could only be performed intermittently in specialized facilities. Here, we present a bioresorbable implant that monitor various biochemical markers of organ complications directly in organs, which can be programmed to safely disintegrate after completing its monitoring task. The device is fabricated through a photolithography-free, 3D-printing-based process that enables a flexible and self-anchoring microneedle sensor array with individually addressable channels for high-resolution spatiotemporal mapping of organ physiology. We demonstrate its functionality in animal models of clinically relevant complications, including kidney ischemia and gut dysfunction, underscoring its potential to advance perioperative organ care.

Speaker biography:

Dr. Wei Ouyang is an Assistant Professor of Engineering (ECE/BME) at the Thayer School of Engineering at Dartmouth College, where he leads the Bio-Integrated Microsystems Group. His research focuses on developing body-integrated biosensors and bioelectronic systems for precision healthcare. Prior to joining Dartmouth, Dr. Ouyang was a postdoctoral fellow with Prof. John A. Rogers at the Querrey Simpson Institute for Bioelectronics at Northwestern University. He received his BS in Microelectronics from Peking University and both his SM in Electrical Engineering and Computer Science and PhD in Electrical Engineering from the Massachusetts Institute of Technology (MIT), where he was advised by Prof. Jongyoon Han. His honors include the NIH Maximizing Investigators'Research Award (MIRA), the Dimitris N. Chorafas Foundation Prize, the Helen Carr Peake and William T. Peake Research Prize, the Ernst A. Guillemin Thesis Award, and recognition as a Siebel Scholar (Class of 2016).

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