陽明交大機械系深化國際演講系列

Prof. Chee Pei Song
Universiti Tunku Abdul Rahman (UTAR)

Flexible Self-Powered Sensors and Energy Storage for Wearable Applications

TUESDAY
16 Dec. 2025
Time: 11:00
to 12:00 AM

TRoom 322B, Engineering Building V,

Speaker Bio:

Pei-Song Chee is a Professor at Universiti Tunku Abdul Rahman (UTAR), Malaysia, where he has served as the Chairperson of the UTAR Center for Healthcare Science and Technology (CHST) since 2022. He is also a member of the Editorial Board for Scientific Reports and Chairperson for IEEE RFID Malaysia Chapter.

His research focuses on robotic sensors with an emphasis on self-powered mechanisms, including triboelectric systems, RF wireless power transfer, and electroactive polymers for sensing and actuation. Dr. Chee has authored over 60 ISI-indexed journal articles, with 90% as the first or corresponding author in prestigious Q1/Q2 journals such as Lab on a Chip, NPJ Flexible Electronics, and Chemical Engineering Journal. His work has gained significant recognition, including a 2022 top-accessed paper in IEEE Transactions on Antennas and Propagation and a 2020 featured article in IEEE Sensors Journal. Dr. Chee holds 7 national and 1 international patents and has secured over RM 2 million in competitive academic and industry grants as a PI/Co-PI. He has been leading an independent research group for over 9 years, supervising 12 PhD students, 17 Masters students, and 2 postdoctoral fellows.

Abstract:

In an era marked by the rapid rise of artificial intelligence (AI) and the increasing demand for energy-efficient solutions, the integration of self-powered sensors is becoming more critical than ever. As society becomes more energy-hungry, innovative technologies such as wireless power transfer and triboelectric systems offer promising solutions to meet these demands. This talk will explore the cutting-edge advancements in flexible, self-powered sensors and energy storage for wearable applications.

Starting with an overview of the evolution from traditional silicon-based sensors to the next generation of textile-based mechanical sensors, the talk will delve into the use of laser-induced graphene (LIG) technology for enhancing sensor performance. The potential of LIG as a material for flexible sensors will be discussed, highlighting its versatility in wearable technology.

Furthermore, the talk will introduce the latest research from our group, focusing on innovative approaches to textile-based energy storage. We will explore how these energy-harvesting and storage technologies can seamlessly integrate into wearable devices, providing a sustainable and self-sufficient solution for powering sensors in real-time. By leveraging these technologies, we can make significant strides in creating energy-autonomous wearables that are crucial for the AI-driven future.

UTAR UNIVERSITI TUNKU ABDUL RAHMAN 马来西亚拉曼大学

NATIONAL YANG MING CHIAO TUNG UNIVERSITY 國立陽明交通大學機械系