SISP 1318
Making a Smart Garbage Bin by Internet of Things Technology

Course Description

This course aims to introduce the state-of-the-art technologies in science and engineering for smart system design. This experiential course will provide an overview to potential students who wish to engage in integrative systems and design. Students will design and develop a prototype through various innovative learning activities under the guidance of instructors, explain the underlying scientific principles, integrate the multidisciplinary knowledge with innovation and creativity to critically evaluate real-world problems. This course also serves to strengthen students' concepts in science and engineering, especially in the area of internet of things.

Topics

- Integrative Systems & Design and Internet of Things (IoT)
    - Designing a smart home system; Linking different gadgets into the smart home application
- Embedded Systems
    - Programming on chips and processors
- System Sensors
    - Detecting the environment by IR sensor and Ultrasonic sensor
- Developing a Prototype
    - 3D Graphic Design and 3D Printing
- Communication Technology
    - Establishing information exchange of different gadgets
- System Integration
    - Connecting gadgets to a central server system

Grading Scheme

- Project Report (40%)
- Presentation (40%)
- Peer Evaluation (10%)
- Class attendance and participation (10%)

[Topics and grading schemes are subject to change as deemed appropriate. Students will receive information and guidelines in class on how they will be assessed for the course.]

Teaching Mode

The course will be delivered face-to-face.

Attendance Requirement

Attendance is expected and required. The minimum attendance required is 70%. Attendance for the assessment activities [e.g. group presentation and final exam] is mandatory.

Instructor(s) Profile

Prof. Shenghui SONG

Prof. Song is now an Assistant Professor jointly appointed by the Division of Integrative Systems and Design (ISD) and the Department of Electronic and Computer Engineering (ECE) at the Hong Kong University of Science and Technology (HKUST). His research is primarily in the areas of Wireless Communications and Machine Learning with current focus on Distributed Intelligence, Semantic Communications, Machine Learning for Communications, Integrated Sensing and Communication, and Information Theory. Prof. Song is also interested in the research on Engineering Education and served as an Associate Editor for the IEEE Transactions on Education. He has won several teaching awards at HKUST, including the Michael G. Gale Medal for Distinguished Teaching in 2018, the Best Ten Lecturers in 2013, 2015, and 2017, the School of Engineering Distinguished Teaching Award in 2012, the Teachers I Like Award in 2013, 2015, 2016, and 2017, and the MSc(Telecom) Teaching Excellent Appreciation Award for 2020-21. Dr. Song was one of the honorees of the Third Faculty Recognition at HKUST in 2021.