ELEC1030   The Rise of Autonomous Robots

Course Description

This course is designed to give students with little or no technical background a general understanding about robots and their potential impact. Our society is on the verge of a new era of technology convergence: robotic devices are envisioned to become a nearly ubiquitous part of our day-to-day lives. New technologies such as wireless communication and voice and visual recognition will make robots become behaviour-based, cognitive and biologically-inspired humanoids. Fundamental social, economic, and technological issues of a human-machine society will be identified and discussed in interactive sessions. The learning process is designed to transcend conventional boundaries between technology and other disciplines, and will be facilitated by a series of demonstrative sessions presenting students with opportunities to observe, evaluate, examine, and interact with a variety of commercial robots and humanoids. Guided by internal and external experts, students will focus on a specific social, business or technology issue, identifying and exploring potential solutions enabled by robotic and automation technology. In this exploration process, students will be encouraged to apply their personal background and interests, and possibly experiment with robot kits.

List of Topics

Lecture Topics
1. Technology trend
2. Basic concepts and the making of robots
3. Machines to live with: Social robots
4. Machines to live with: Medical robots
5. Machines to live with: Mobile robots and drones
6. Introduction to Autonomous Vehicles
7. Benefits of Autonomous Driving
8. Autonomous Ride Services
9. Trucks, Delivery Vehicles, and Buses
10. Technologies Enabling Autonomous Vehicles
11. Disruptions Caused by Autonomous Vehicles
12. Government Regulation & Support

Statement of Objectives/Outcomes:

On completion of this course, students will be able to:

CO1 – Obtain a holistic view of the robotic future

CO2 – Recognize and understand the various components of robotic systems and how they work together with their basic functions

CO3 – Comprehend fundamentals of basic autonomous systems and robots and their development principles

CO4 – Enhance the knowledge in engineering, practical programming, and system evaluation

CO5 - Develop skills of concept exploration, critical thinking and teamwork; Appreciate the potential value of robotic technology to the society