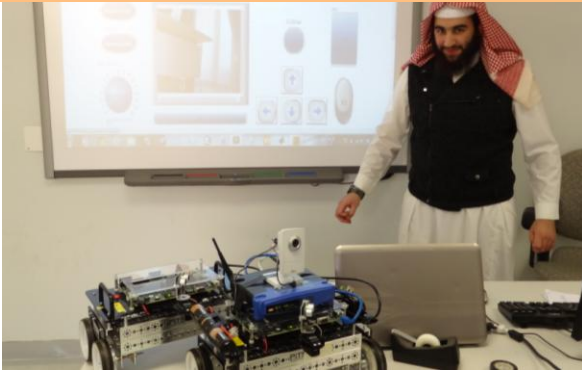


Embedded Systems & Robotics Laboratories



Embedded Systems Laboratory

This lab is used for conducting experiments in embedded systems using equipment from National Instruments. Experiments involve microcontroller programming, Smart Camera control, etc. and use LabVIEW software for configuration and programming.

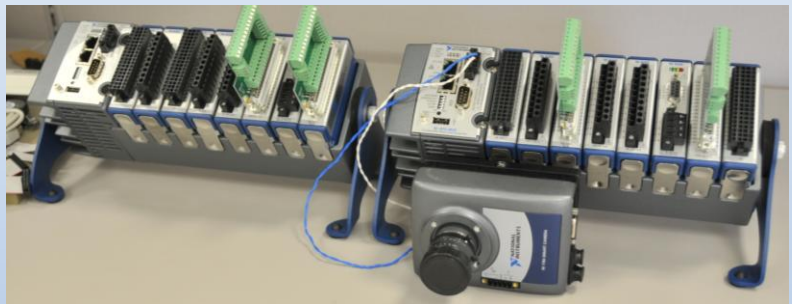
Robotics Laboratory

This lab is used for conducting experiments in robotic systems. Experiments involve motor control, obstacle avoidance, navigation techniques, etc. A robotic starter kit from NI is used.

The NI LabVIEW Robotics Starter Kit, also known as DaNI, is an industrial-grade, out-of-the-box robotics platform designed for teaching robotics and mechatronics concepts or for prototyping a robotic system. The kit features sensors, motors, and an NI Single-Board RIO device for embedded control. The robot can be programmed using the LabVIEW graphical development environment.

Major Equipment

- ❖ PAC (Programmable Automation Controller) system:
 - NI cRIO 9025 Real-Time controller
 - C series modules
- ❖ NI 1764 Smart Camera with I/O accessory
 - NI LabVIEW Embedded Module for ARM Microcontrollers
- ❖ DaNI Robotic Starter Kit



Experiments

- Introduction to LabVIEW & DaNI
- Ultrasonic Transducer Characterization
- Motor Control
- Kinematics
- Range Finding
- Obstacle Avoidance
- Odometric Localization
- Navigation & Mapping

