

Robotics Playground

Course Details

Description

Learn MATLAB, Simulink and Stateflow for mobile robotics through a series of project-based exercises with virtual robots. The courseware contains step-by-step exercises on integrating common robot sensors and creating teleoperated and autonomous mobile robot algorithms.

Materials include a MATLAB and Simulink library of virtual environments designed to aid in the teaching of basic concepts in robotics such as driver control, autonomy programming, obstacle avoidance and object interactions.

Learning Outcomes

- Learn MATLAB programming using variables, scripts and functions
- Learn Simulink modeling for time-based simulations
- Learn Stateflow for robot programming using flow charts
- Learn how to program robot remote controls
- Learn how to avoid obstacles and follow objects using distance sensors
- Learn how to program a maze-solving robot (final project)

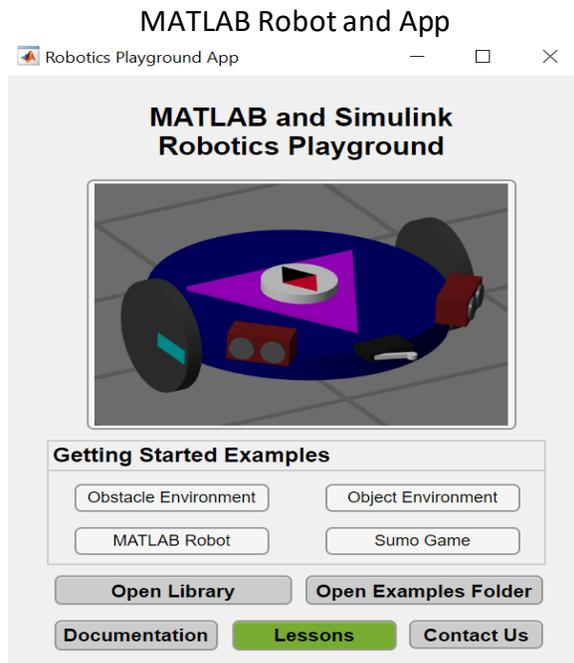
Course Contents

Lessons (with slides and examples):

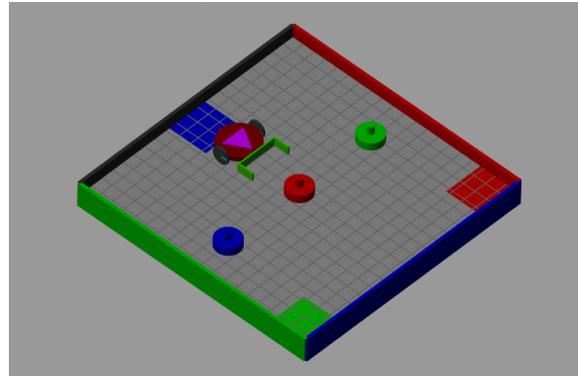
- Unit 1: Intro to MATLAB
- Unit 2: Basic Robot Movements
- Unit 3: Intro to Simulink
- Unit 4 Robot Controls
- Unit 5: Using a Distance Sensor
- Unit 6: Using MATLAB Functions
- Unit 7: Intro to Stateflow
- Unit 8: Maze Solving Robot
- Intro to VEX and Student Resources

Robotics Playground

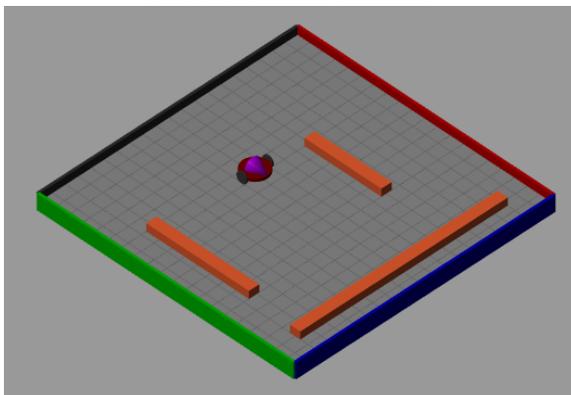
Virtual Environment Models



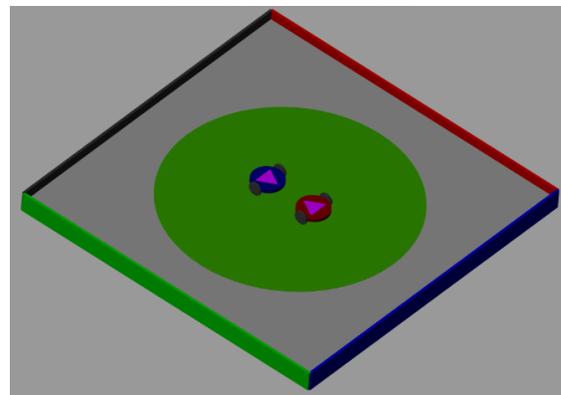
Object Environment



Obstacle Environment



Sumo Environment



Resources

[Simulating Mobile Robotics Using Virtual Worlds: Getting Started Video](#). Set up and use the MATLAB® and Simulink® Robotics Playground to get started with programming and testing robots in virtual worlds.

For more information, [visit our Primary and Secondary School page](#)