

Robot Racing Challenge using TI's Robotics System Learning Kit

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The Story

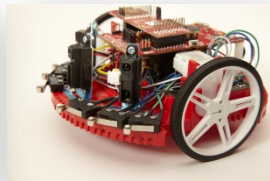
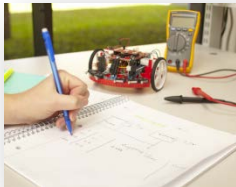
Students long for a fun yet simple platform for learning software development, embedded systems, power distribution, and IoT. An effective approach to education is to provide a hands-on lab that is simple enough for students to fully understand what they are building yet deep enough to expose fundamental engineering principles.

Background: What is RSLK?

- **Comprehensive, modular**, curriculum to teach embedded systems and applications
- Accompanied by a robotics hardware kit that provides an active learning experience
- Courseware will guide you to **design, build, code**, and finally **test** your own robotic system
- Collaborate to compete and develop **problem solving skills, systems knowledge**, and **creativity**

<https://training.ti.com/ti-robotics-system-learning-kit>

<http://users.ece.utexas.edu/~valvano/arm/msp432.htm>



Curriculum

Hardware

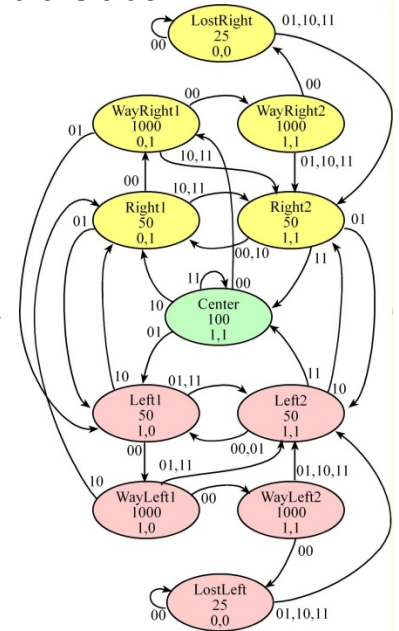
Software (CCS)

TI Resources

Ultimate goal: drive the robot as far as possible in 3 minutes around the track

Sign up for driving school:

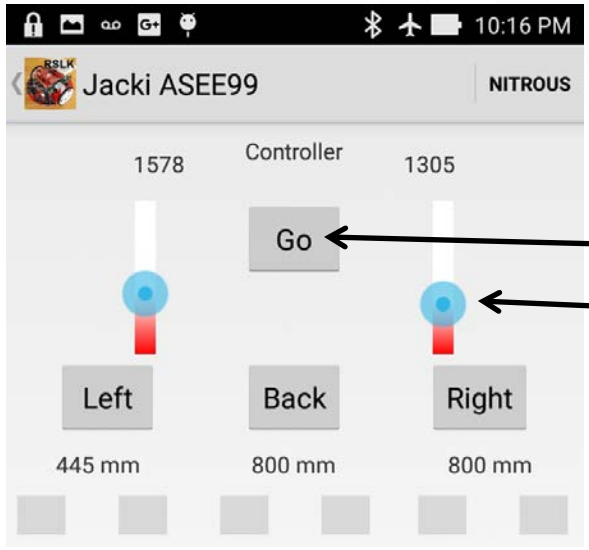
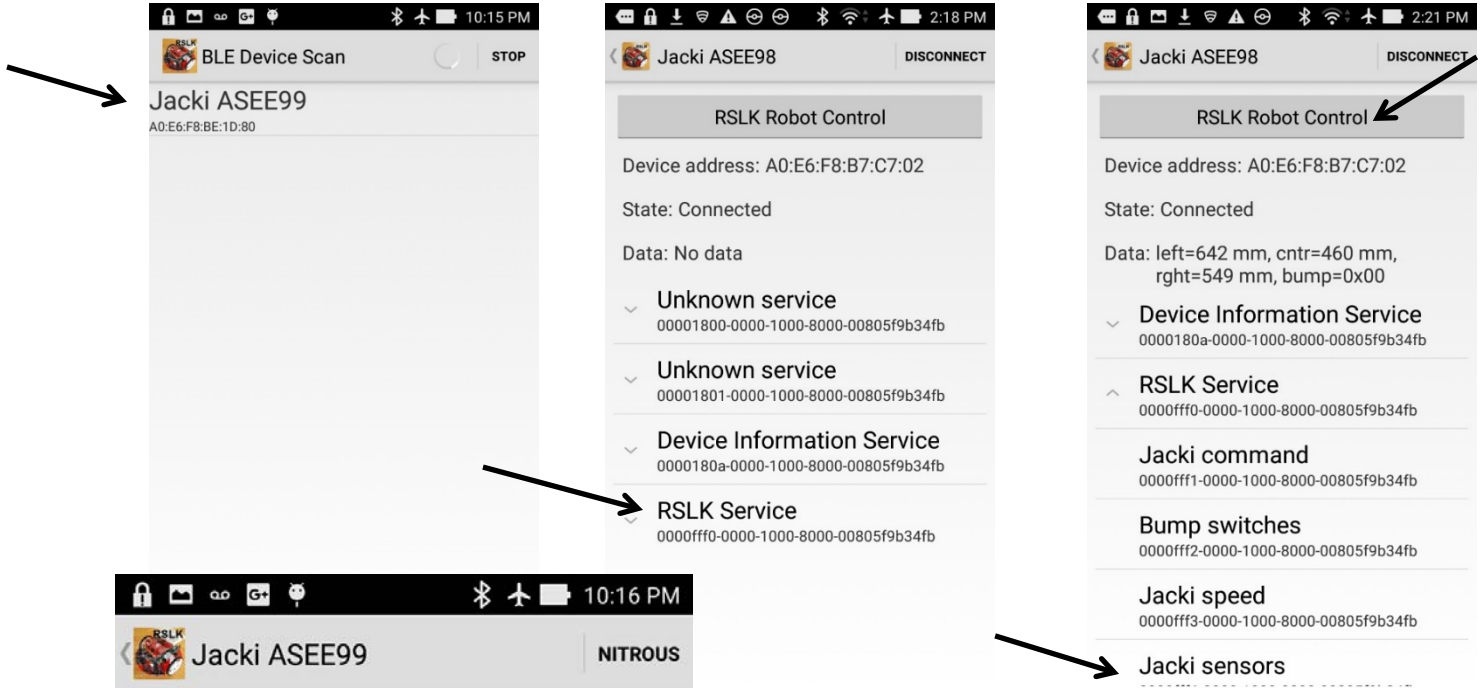
- Learn the features of the robot
 - Sensors: line sensor, bump, tachometer, and IR distance
 - Microcontroller: MSP432 LaunchPad programmed in C
 - Power distribution: battery, regulators, motor drivers
 - BLE: using the CC2650
- Lab 7: FSM implementation of line following
- Lab 16: Incremental controller using the tachometer
- Lab 17: Autonomous driving using IR sensors and proportional control
- Lab 19: BLE
 - Getting started using the Android App
 - RSLK service has four characteristics
 - Jacki Command,
 - Bump switches
 - Jacki speed (motor PWM),
 - Jacki sensors



Download and install the Android app **rsik** <http://users.ece.utexas.edu/~valvano/android>

Robot Racing Challenge using TI's Robotics System Learning Kit

Turn on robot (observe the robot number on the LCD). To run one of the labs, press Sw4 for Lab 19 BLE



Push the buttons
Move the sliders

When you are ready to race:

- Robots start at different locations on track
- All robots start at the same time going CCW
- The robot will stop on bumper touch
- The display updates twice a second
- Race ends after 3 minutes or 4 laps
- Winner is the one which traveled the farthest
 - Accumulative points
 - You can race multiple times (just log in again)
 - 5 for first place, 3 for second, 2 for third, 1 for rest
 - Top 8 scores race in the finals

