



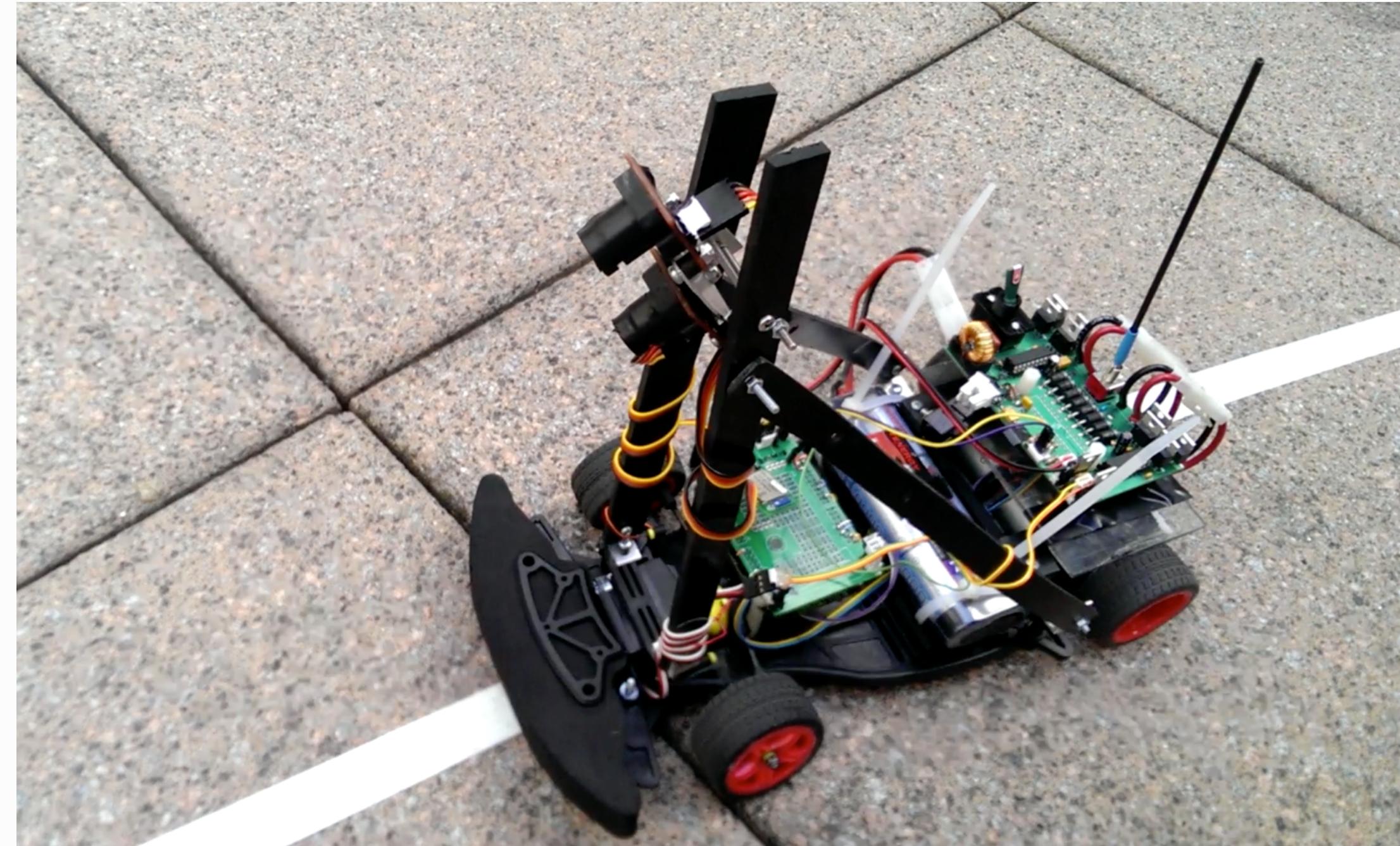
# Maruchi Kim's Portfolio

---

I'm an Electrical Engineer passionate about robotics, mechatronics, and embedded systems.

# Maruchi Kim's Portfolio

Course Project for EE192: Mechatronics Design Lab



## The Autonomous Racing Vehicle Project

Designed a racing robot which can follow a curving and self-crossing racetrack at 3+ meters per second using optical sensing.

Implemented edge detection CV algorithms to detect racetrack in outdoor or indoor lighting conditions with auto-exposure control.

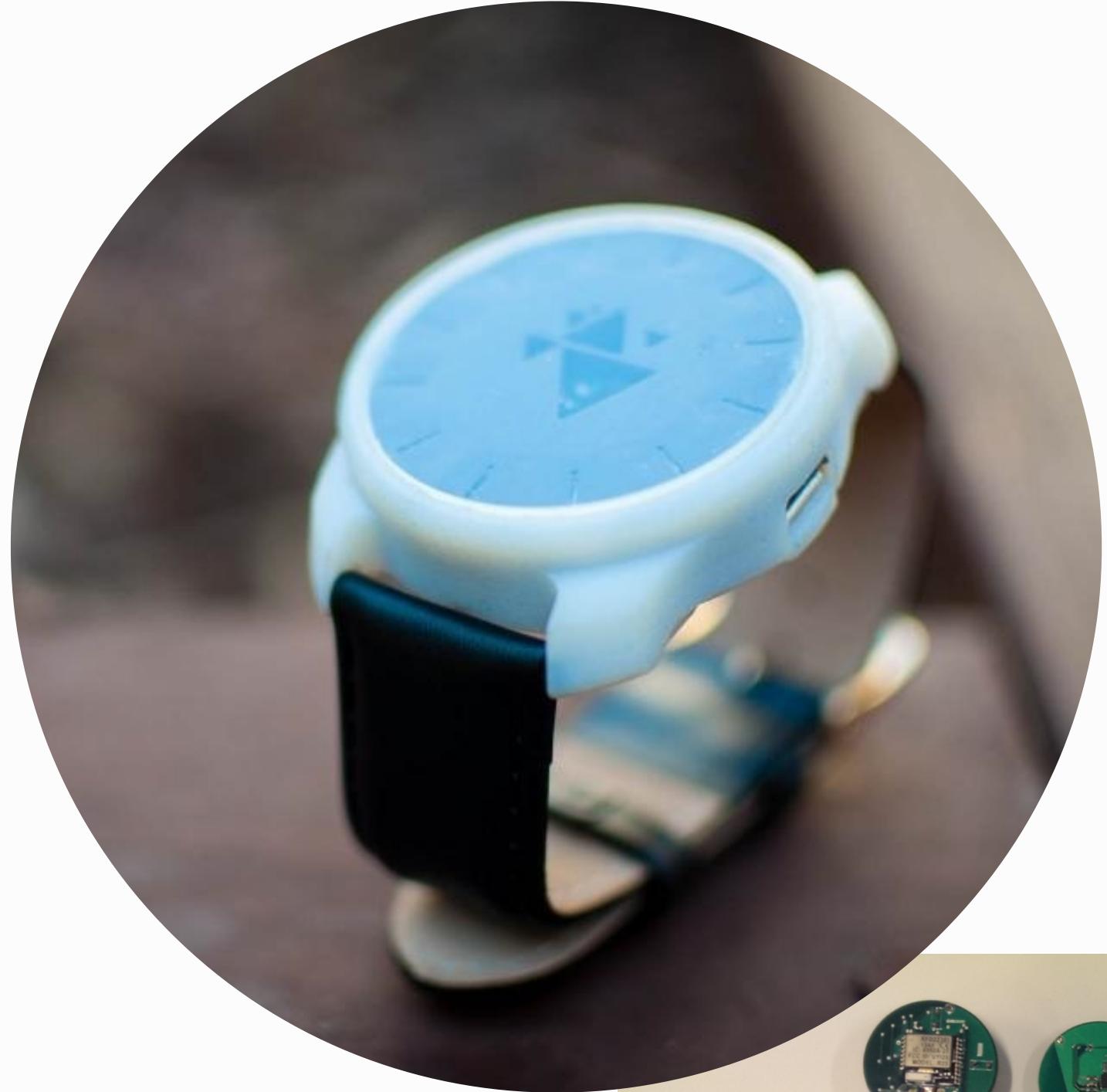
Vehicle operates completely autonomously with proportional velocity control and PD steering control across a 100+ meter course.

1st place team out of 30+ undergraduate teams at NATCAR: The Intelligent Autonomous Racing Competition, hosted at UC Davis

<http://www.ece.ucdavis.edu/natcar/results/2014-race-results/>

# Maruchi Kim's Portfolio

Side Project while at Nokia Internship



## The Apollo Watch Prototype

Integrates an ultra-violet sensor, piezo, vibrating motor, 12 full visible-spectrum LEDs, 70mAh LiPo battery, universal micro-usb port, and a Bluetooth 4.0 Low Energy radio transceiver w/ built-in ARM cortex M0 micro-controller in a <10 mm profile.

Apollo encourages users to stay healthy and enjoy life by tracking your body's exposure to UV and daily golden hours, sunsets, and sunrises. Users can interact w/ the watch through touch-capability and receive visual and haptic feedback. There is a compatible iOS and Android application that allows for additional functionality.

Prototyped in 4 weeks. Built from scratch.

# Maruchi Kim's Portfolio

CITRIS Mobile App Challenge Project



## Two Cents

Mobile application focusing on "spreading philanthropy through pocket change" by allowing two cent per day donations.

Currently partnering with non-profit organizations and developing the service.

Successfully competed in the CITRIS Mobile App Challenge against 13 other teams to win \$1000 in prize money

<https://www.youtube.com/watch?v=wRtLMYtwMhE>

# Maruchi Kim's Portfolio

Cal Hacks Hack



## Bartndr - A Location Aware End-to-End Retail Solution

Made in 36 hours during Cal Hacks 2014.

Winner of 'Kleiner Perkins Caufield Byers Fellows Prize'

Winner of 'Facebook - Best Use of Parse Prize'

Bartndr is an automated, location-aware end-to-end retail solution. It includes the Bartndr iOS app that serves as beautiful location-aware point of sale system through the use of iBeacon technology + Braintree. It also includes the Bartndr Barbot, which serves as a simulation of automated retail production

Link:

<http://challengepost.com/software/bartndr-a-location-aware-end-to-end-retail-solution>

# Maruchi Kim's Portfolio

Interactive Device Design Class Project



## Tony

A smarter, connected lightbulb. Tony can be controlled over the cloud. This means user control via 4G LTE to turn off the lights when he/she is away, and automatic dimming as the night progresses.

A voice-enabled base station. Tony allows users to control not only our lightbulbs, but also future smart home appliances without having to use their smartphone. Voice recognition increases efficiency and also reduces the clutter of apps on users' smartphones.

A BLE mesh network. The increasing number of devices in the IoT space demands a new BLE/WiFi mesh network to enable connected devices without a smartphone. Tony is a lightbulb with BLE connectivity. Because lightbulbs are everywhere, future smart devices will now always have a nearby BLE lightbulb to stay connected.