Welcome!

Electrical Training Week 0

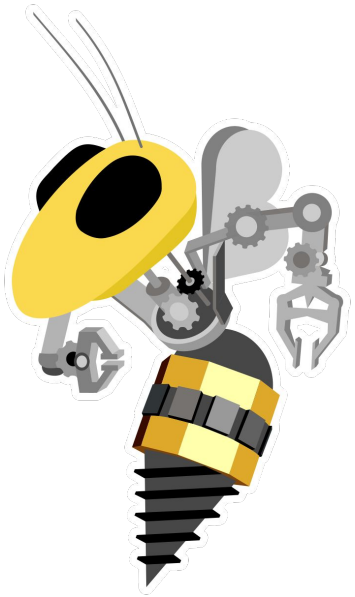
RoboJackets

Competitive Robotics at Georgia Tech

www.robojackets.org

Agenda

- Introductions
- What do we do in RoboJackets?
- Target Skills
- Expectations
- Timeline for the semester



Introductions

You should know these people

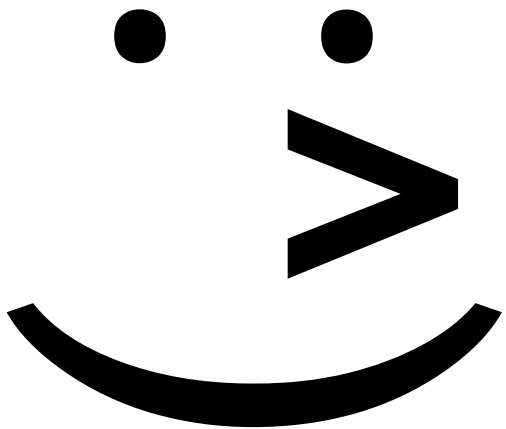
Varun Madabushi

- 3rd Year Electrical Engineering Major
- Hometown: Tampa, FL
- Teams: RoboRacing, Outreach

Juan Elizondo

- 3rd Year Electrical Engineering Major
- Hometown: Greenville, SC
- Team: Sumo Electrical
- Electrical Core lead

Arvind Srinivasan



- 2nd Year Computer Engineering Major
- Hometown: Ashburn, VA
- Team: RoboCup

Asha Bhandarkar

Me !

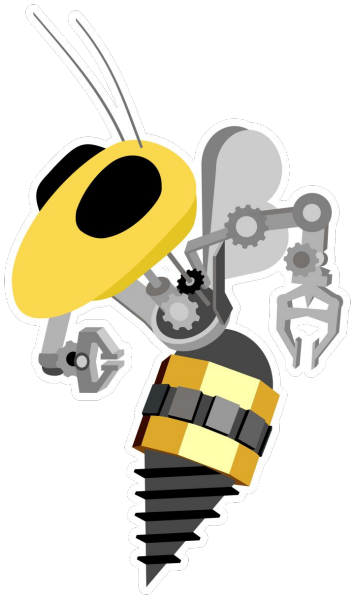
- 2nd Year Computer Engineering Major
- Hometown: Athens, GA
- Team: IGVC

Marine Maisonneuve

- 2nd Year Electrical Engineering Major
- Hometown: Paris, France
- Team: Robocup

Austin Keener

- 5th Year Electrical Engineering Major
- Hometown: Gainesville, GA
- Team: RoboRacing

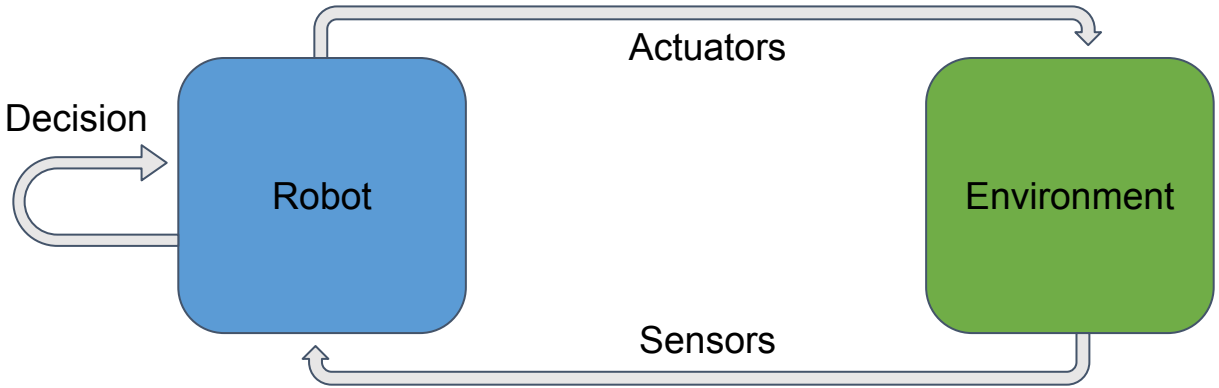


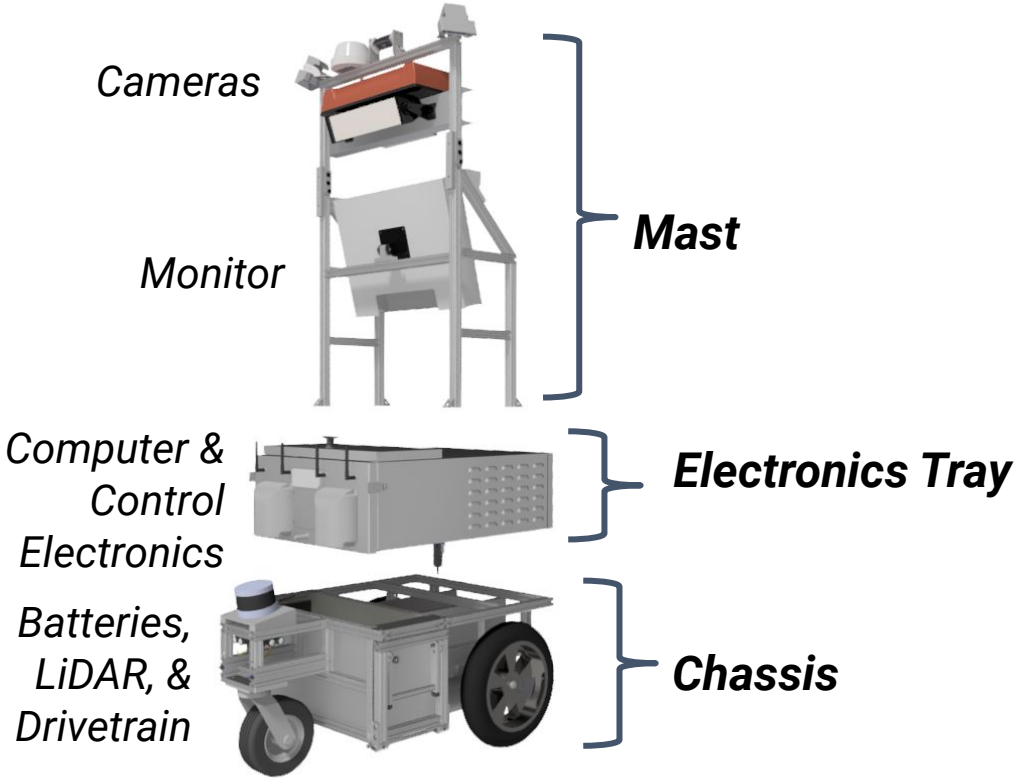
RoboJackets Electrical

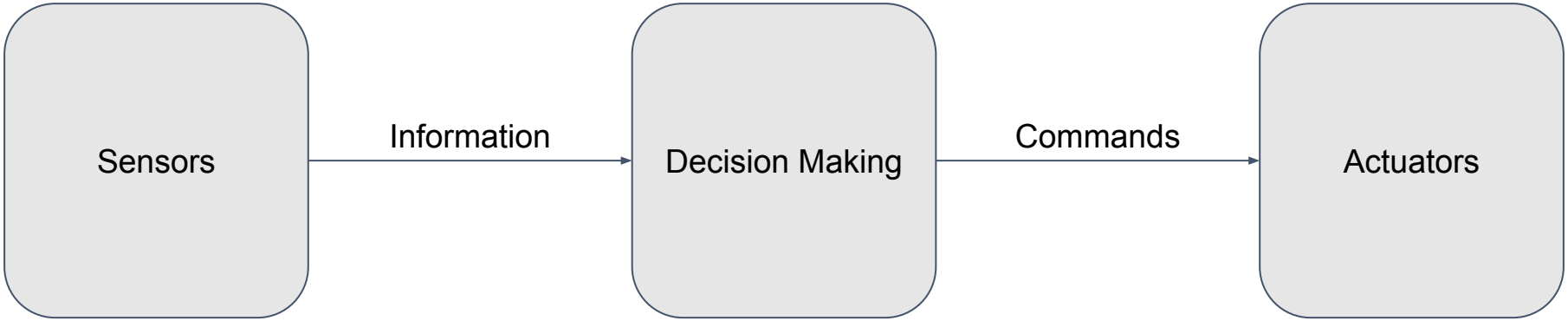
RoboJackets
Competitive Robotics at Georgia Tech

“A robot is a machine that autonomously interacts with its environment”

What is a Robot?




Cameras
Monitor
Mast
Computer & Control Electronics
Electronics Tray
Batteries, LiDAR, & Drivetrain
Chassis



- LiDAR
- Inertial Measurement Unit
- Cameras
- Wheel Encoders

- Custom-built Computer
- MBed Microcontroller

- 2x Brushed DC Motors

Electrical Scope

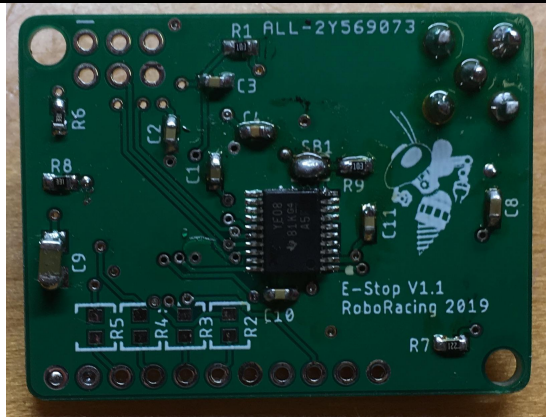
- Deliver power to all electrical components
- Convert sensor readings into information and communicate that to computing system
- Convert commands into control signals and communicate that to actuators

What we do

- Determine system requirements based on other subteams
- Design, assemble, and test robot power and control systems
- Develop Printed Circuit Boards (PCBs) to integrate various functional components
- Implement complex behaviors through firmware programming
- Ensure safety for team members through automatic and/or manual cutoffs

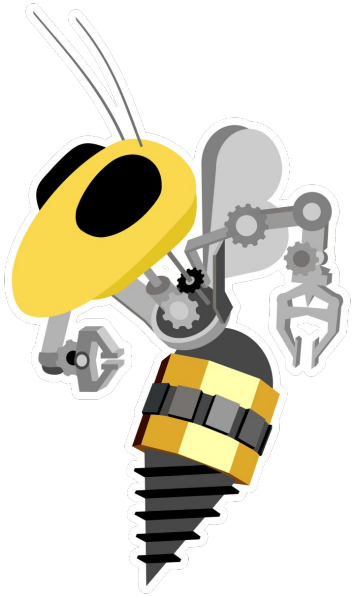
Skills Used

- Embedded Systems
  - Digital circuit design with microcontrollers
  - Inter-circuit and computer communication
  - Microcontroller programming
- Control
  - Sensing
  - Control system design
  - Actuator dynamics
- Hardware
  - Soldering
  - Wiring
  - Assembly



Printed Circuit Board

Arduino Microcontroller



Electrical Training

Format

- 9 weeks of training:
  - 6-8 PM
  - Skipping Fall Break (Oct 14 week)
- Tuesday and Wednesday options
- Lecture/Discussion followed by exercise
- Watch training videos before coming

Training Content

- Develop knowledge of electronic components
- Understand purpose and capability of microcontrollers
- Introduction to EAGLE CAD software
- Introduction to embedded C/C++ programming

Tips for Success

- Check Slack and email
- Watch the videos before the week's training
- Don't be afraid to ask questions during training
- Google is your best friend
  - All of us in RoboJackets are here to learn
  - Figure out things as you encounter them
- Make friends with the people around you

Slack

- Join #<your team>, #<your team>-electrical, and #electrical-ama
  - #pixie-wranglers for memes/offtopic
- Set a profile picture (please)
- Set a “What I do” bio
  - <your team> Electrical
- Other channels
  - #sportsball, #pets, #recognitions, #rj-girl-gang

Electricity Reference

- Go to this website: github.com/robojackets/electrical-training
  - Under it see references > electricity_basics
- This repository is where all reference materials will be posted (including slides after the week is over)