



# Advanced Manufacturing Academy 2016



Cost Effective ROBOTICS  
for the Classroom

College of Engineering and Technology

East Carolina University

# Robotics – Great STEAM

- Combine all the STEAM Aspects
- Robots are expensive and complicated
  - How to keep it simple?
- Three special programs shown
  - Low cost
  - Anybody can do it
  - Flexible and mobile
  - Demonstrate technology and concepts
  - FUN!

# “Gateway” Robotic Programs

- Roboxsumo
  - Cardboard robots compete in a sumo competition
  - No computer – Hand held RC
  - Complete in 2-3 hours in any location
- Creek Creepers
  - Underwater ROV
  - No computer – Wired control unit
  - Complete in 2-3 hours – need water
- Programmable Roboxsumo
  - Simple robotics platform to build maze follower
  - Computer controlled – Autonomous
  - Program can vary from 12-40 hours

# Roboxsumo

- Cardboard robots in “sumo” competition



# Creek Creepers

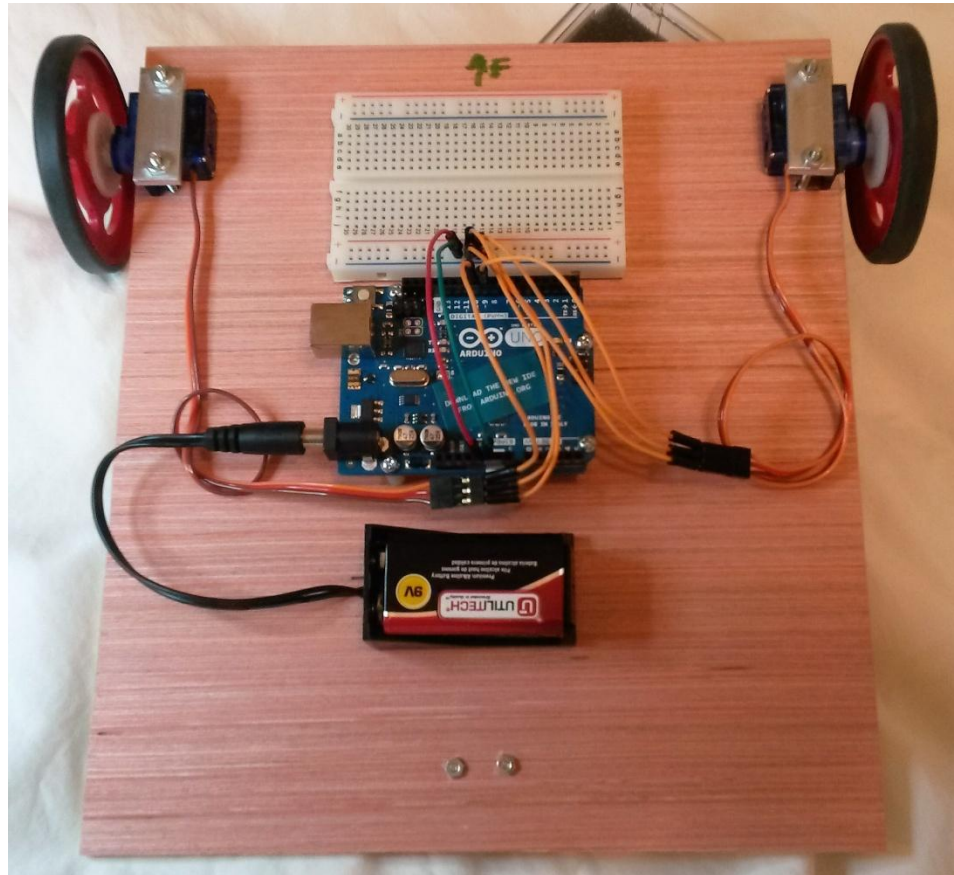
- Underwater ROV robots
  - Design follows the Sea Perch Program\*



\* <http://www.seaperch.org>

# Programmable Roboxsumo

- Simple programmable robots
  - Arduino based



# Roboxsumo

- Let's Start here!!



# Roboxsumo – The Rules

- Push your competitor out of the ring
- 60 seconds to push them out
- If nobody is pushed out – lighter robot
- Same weight? Smaller robot
- If your brain falls out – you lose



# Roboxsumo – Design

- Robot must fit inside of 12” x 12” square
- Use only the parts provided
- Brain must install and remove
- Motors – R on Right, L on Left
- Careful installing the wheels
  - Note “D” shaped opening.

# Roboxsumo – The Kit

- Each team receives same parts
  - Cardboard
  - Motor/Harness assembly
  - Wheel/tires
  - Zip ties
  - Aluminum tape
  - Ping pong ball
  - Paper

# Roboxsumo – Outline

- Work for 60 Minutes
- When finished
  - Clean up
  - Bring remaining parts and tool back
  - See a student to “test” your robot.

# Roboxsumo – Time

- 1 Minute!