

# Soft Braitenberg Vehicles

## **Brief Description of Design Project Goals:**

### **Overview:**

Soft robots have recently gained a lot of interest because of their potential applications in safe human-robot interaction, versatile manipulation abilities, and robust operation in unstructured environments. We are exploring several aspects of these soft robots including the potential for untethered small-scale soft robots, implementation of sensors in soft robots, and underwater soft robots.

### **Specific MEng Contribution:**

Although soft robots have become very popular recently, most still operate open loop. Only in the field of soft manipulators have feedback sensors really started to play a significant role. The students will bridge this gap by implementing a (mostly) soft version of a Braitenberg vehicle. This project will involve collaboration between an ECE and MAE student. Likely, the design will focus on a pressurized slug-like robot able to inch towards or away from the light using sensors based on standard small rigid IR receivers. Actuators will be based on miniature pistons, pumps, or SMAs. Weekly meetings will be held to assure progress of the project.

### **ECE Field Advisor Name:**

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### **Project Web Site:**

<http://cei.ece.cornell.edu/research-2/soft-robot-actuators/>

### **Number of MEng Students Needed:**

2

### **Required Skills:**

Smart, motivated, and creative students interested in robotics and practical implementations. Students are required to have 1) basic knowledge of circuit design, microcontrollers, embedded programming, DC motor, and IR receivers; and/or 2) experience in Solidworks CAD design software, rapid prototyping, and basic knowledge of statics and dynamics. Furthermore, experience with molding and casting would be a plus.

### **Estimated Project Time Frame:**

2016-17 Academic Year, Two (2) Semesters