ECE Capstone program
Spring 2018
Project Abstract & Info

1. Project number: 41

2. Project title (as will appear on the poster): Unmanned Aquatic Cleaner (UAC)

3. Team members: Beshoy Awad, Michael Habib, Michael Youssef

4. Adviser: Sasan Haghani

5. Up to 5 keywords that will help to classify the project scope:

Computer Vision, Automation, Environmentally-Friendly, Cleaner, Aquatic

6. Project abstract (up to 250 words) to be shared with judges:

Our rivers, lakes, and seas are all polluted with litter, all across the globe. Our goal is to design and build an automated aquatic cleaner that can identify tangible objects such as bottles, cans, and other litter that is harmful to the environment as well as living creatures. Upon identifying a piece of litter, our robot will remove it from the water and into a bin that the robot carries. The goal of this project is to be able to drop a UAC into any body of water and have it clean the body of water forever without any human intervention.

For this project to be feasible we must be able to create a program that will distinguish between litter and nature. This will be accomplished via a Raspberry Pi that uses OpenCV and Python to pass an image from the mounted camera through a deep neural network in order to correctly identify what is in the image, as well as its location relative to the camera. Its location will then be used to direct the rudder and motors. Once the litter is detected to be on top of the loader, a command is sent to the loader's servo to activate it and lift the litter into the basket.

We would like to attach solar panels in order for the UAC to be constantly operating without any need for human intervention.