Robotic Development for Cleaning Coastlines: Coastline Cleanliness

Sika-Amoah, Yakina (School: Syracuse Academy of Science)
Simon, Theodore (School: Syracuse Academy of Science)

Plastic pollution is a major pandemic for the environment. For the last 27 years, over 9.5 million volunteers have collected 163 million pounds of garbage from more than 330,000 miles of coastline and rivers in 153 countries and locations, according to Ocean Conservancy [1]. This problem affects sea animals, the food chain, and the beauty of our coastal areas. Therefore, one aspect that is intriguing is the development of robots for garbage collection, particularly in hazardous areas. Robots empower humans to be liberated from activities that are tedious, require high precision, or take place in dangerous environments. This project presents the garbage collection robot (AtomRobot) on coastal areas using wireless communications. The robot is built on a mecanum wheel which is an omnidirectional wheel design for land-based robots to move in any direction. Its size is 17x17x15 inches and the weight is approximately 40lb. The power is supplied from a 12V 3000 mAh battery. The user can control a robot via a block coding program with an android phone up to 150 feet distance. The results of robot performances found that the robot can move with an average speed of 0.5 meters per second on the floor via wireless communication and collect the 10-15 cm diameter garbage. It can store 10 pieces of garbage in its storage and send the garbage to the collection bin from up to 12 feet away. It can grab the garbage with its hand and also store waste in an additional trash bin which can be attached to the Atom Robot. [1]http://www.oceanconservancy.org/who-we-are/newsroom/2013/ocean-conservancys-internationalcoastal-cleanup-announced-for-september-21.html.

Awards Won: