Remotely Operated Cleanup

About a thousand miles northeast of Hawaii, there's a floating island of trash twice the size of Texas, caught in the Pacific Ocean. It's one example of marine environments the world over that are stressed by discards of human culture. A group of about three dozen young men and women in Marietta, Ga., have their eyes on that problem and are trying to do something about it.

They have developed a coloring book in order to engage young children in their cause. The group's Web site offers public service announcements about marine pollution. But consciousness-raising is only part of their purpose. They are also developing machinery designed to take direct action against waterborne trash.

The group has demonstrated a working prototype of a remotely operated vessel that can pick up floating bottles and other litter. It's a simple structure made of spare parts, but it works, at least on a lake in a public park. What is probably most remarkable about it is that all the members of the team are students at Kell High School.

The team, Kell Robotics, was formed to take part in the FIRST competitions. That's an acronym of "For Inspiration and Recognition of Science and Technology," so the students caught the bug. Now they work on robots not just for the games, but all year long.

The ROV, dubbed Corky, weighs about 140 pounds by itself and carries a 60-pound battery. The structure, which looks like a bridge truss on pontoons, is six feet wide, four high, and ten long. A large wire basket between the pontoons dips under the surface and then lifts to capture floating debris so it can be retrieved for proper disposal.

Brijal Patel, a senior at Kell and executive director of Kell Robotics, told us that Corky is largely made of parts recycled from old robotics kits used in FIRST competitions. Principal sponsors of the team, she said, are General Electric, Cobb Energy (a unit of the area's power co-op), and Women in Technology.

Kell Robotics has applied to the 2010 SeaWorld/Busch Gardens Environmental Excellence Awards, which could net a prize of $10,000. Patel said one possible use of the money could be to equip Corky, or another prototype, with a robotic arm and camera or other sensing technology that would let it find and retrieve garbage under the surface.

▲ Robots for a cause: Inspired by FIRST, a high school team built and demonstrated an ROV named Corky, which is designed to pick up floating trash and litter.

The project leader for Corky is Alex Epstein, a junior. Corky uses two off-the-shelf electric motors for a tank drive similar to that used in competition robots, Epstein said. The motor that moves the basket is designed for a van door and also comes from an old kit. The basket is made of recycled fencing material.

According to Epstein, the idea that led to Corky was suggested by one of the team's mentors, Ed Barker, an electrical engineer with H I Solutions in Atlanta. Other mentors are Craig Foster, a GE engineer; Jason Seymour, an engineer with Lockheed Martin; Derek Edwards, a grad student at Georgia Tech; two teachers, Joe Leterle and David Burch; and Ruth-Ann Bigley, a staff member of ASME.

According to Barker, the students approach team activities like a business. They understand that "in order to get funding you have to sell the product," he said. "You have to prove it has value."

To keep their focus, students continually ask themselves three questions, he said: What do we do? Why do we do it? How do we do it?

The team's Web site, www.kellrobotics.org, which has links to video recordings, including one of Corky on the lake, makes clear what the group sees as its primary purpose: "The Kell Robotics Team isn't about building robots or gadgets. It is about educating students, parents, and the community about what engineers and scientists really do."

The team is also serious about developing its ROV into a practical tool for cleaning up lakes, rivers, and perhaps oceans. As the students put it: "We make a little progress every week but we have a long way to go. Perhaps we can develop a new sport, fishing for debris."

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