

IPRO 316 - CREATING A ROBOTICS INITIATIVE AT IIT

Goals:

- Create a Robotics Platform at IIT
- Explore the Practical Applications of Robotics Technology
- Peak Robotics Interest in Younger Students

Organization / Tasks:

- Roomba
 - Create Tasks For Robot to Complete
 - Create a Swarm of Modified Roombas
 - Remote Control Using Pyro
- Peppy
 - Develop Robot's Abilities
 - Closely Document Progress
 - Remote Control Using Pyro
- Unmanned Aerial Vehicles
 - Research
 - Share Findings
- Dr.Todd Kuiken's Work With Prosthetics
 - Bring Dr.Kuiken to Lecture at IIT to Share Developed Technology
- Pyro
 - Bring Language and Robotics Knowledge to Area Students
 - Interface the Computers With Roomba and Peppy

Critical Issues:

- Lack of Documentation and Working Usage of Peppy
- Non-working Roomba and Incompatible Microcontroller
- Inconsistent Performance of Pyro on Computers

Future Goals:

- Simultaneously Run All Peppy's Components
- Hold Another Lecture With Someone in Robotics Technology
- Create A Swarm of Modified Roombas (E.M.F.bots)
- Control E.M.F.bots and Peppy With Pyro

Faculty Advisor:

Dr. Peter Lykos

Student Members:

Amanda Bieberich- Mechanical Engineer, 3rd year

Jesse Collins - Aerospace Engineer, 3rd year

Saurabh Dass - Electrical and Computer Engineer, 3rd year

Timothy Frazier - Electrical Engineer, 3rd year

Dennis Payonk - Computer Engineer, 3rd year

Eddie Schwalbach - Materials and Aerospace Engineer, 3rd year

Tyge Sopko - Electrical and Computer Engineer, 3rd year

Robert Todd - Electrical Engineer, 3rd year

Ryan Wallenberg - Electrical and Computer Engineer, 3rd year

Eddie Yang - Electrical and Computer Engineer, 3rd year

This is the fourth semester of IPRO 316 and we continued to build on the initial idea established by the first IPRO. The past semesters have lead to information relating to colleges that have a robotics interest or intelligence. They also developed a robot, Peppy, that can be programmed with multiple features. They were also interested in Roomba and its capabilities. This semester, we decided to branch out from these basic ideas in different directions based on the knowledge and interests of the present members.

We saw an interest in robotics in the high school and college level throughout the United States and also a huge lack in any structure to develop this so one sub-group was focused on this. They explored what was being done in other colleges and tried to determine if it could be used in Chicago area schools. The usability of Pyro, a Python based language written for robots, was explored and found to be acceptable with the desired outcome. The idea is that Pyro can be taken to area schools and taught in the classrooms so as to educate area students. Pyro was also looked at as a possible language to write programs for Roomba and Peppy. As of now, this does not seem possible.

Roomba was seen as a way to take what already exists in the commercial robotics world and develop it further so it can be more useful. The goal was to make a usable platform to support the robotics initiative that already exists at IIT. By converting a Roomba into an EMF room mapping robot this subgroup's long term goal was to create a whole swarm of E.R.M.bots that could be controlled by Pyro. This would hopefully greatly increase the robotics interest and involvement on the IIT campus.

Another way to implement the use of the Pyro language and to spawn the robotics initiative at IIT was through Peppy. This robot was developed in past semesters with little documentation, so this semester a great deal of time and effort went into deciphering and organizing the evolution of Peppy. The hope was to create a workshop to educate future IPRO members on the workings of Peppy to ensure easier additions. Peppy has many abilities such as movement, sonar, voice recognition, and the use of a robotic arm.

A goal of our IPRO was to research what is going on in the real world in the robotics field. This was to show the applicability of what we were trying to accomplish and to possibly draw interest from the student body. One way this was accomplished was by bringing Dr. Todd Kuiken from the Rehabilitation Institute of Chicago. He works with amputee patients and the progress that he has made is unmatched anywhere in the world. We brought him to IIT to speak about his research and the surgeries that he has done. This was also in hopes that he would spark interest in the field and lead current students to futures in the robotic field.

The last way our IPRO choose to research the real world applications of robotics was through Unmanned Aerial Vehicles, or UAVs. Like the name suggests, these are unmanned vehicles that are controlled either remotely or autonomously. Their use is primarily by the military but there are also a few commercial products on the market. The possibilities that these vehicles offer are countless; and as interest grows, their future is unpredictable.

The future of the Robotics Initiative at IIT is exciting and unpredictable. The interest will rise as new students hear about robotics through things like Pyro. Lives will be changed through UAVs and Dr.Kuiken's prosthetics. The robotics platforms will only continue to produce more helpful and hopefully marketable products. The only thing that can be said for certain is that the robotic technology will always be improving.

For more information come see our presentation from 1:00-1:30pm in the Armour Faculty Dining Room located in the basement of the Herman Union Building.
