



YAP DSTR WORKSHOP

The participants gathered in Thompson 107, chatting excitedly among themselves in anticipation for the week to come. The instructors (Daniel Zoch, Dakota Riggs, Austin Carter, and Stephanie Herman) sat in the back, anxious for their month of hard work to pay off in robotics camp they carefully planned. Dr. Joseph Morgan walks to the front of the classroom. With a booming voice, he welcomes everyone to one of the most eventful weeks of their lives.

After Dr. Morgan gave an introduction and explained the rules for the next four and a half days, he split the students into seven groups of four. From there, each student declared their focus for the week. Students could choose from the following specialties: communications, electronics/control, mechanics, and software.

Under the instruction of Stephanie Herman, Media Relations Chair for the laboratory, students focusing on media relations learned how to design graphic logos for their team and created team names. Each day, students updated a daily log detailing the progress of the work on the robot they created. Students learned how to use Twitter in a professional setting by posting pictures of their robot and learned to write effective captions for their photography. To understand the importance and practicality of using social media in the workplace, employees of Texas Instruments video chatted. Through a presentation, they explained how TI utilizes social media to reach out to their customers and potential employees.

Students interested in software learned how to program in Energia, the software language of Texas Instruments under the instruction of Daniel Zoch and Colby Ryan. This program would be put on a launchpad, which would later be connected to the robot so this robot could be controlled by the students' own code. At the beginning of the week, students learned the basic programming and techniques. They specifically learned how to program a microcontroller, which is a computer present in a single integrated circuit and is dedicated to performing one task. The students started with basic examples of making an LED on the launchpad to blink and then moved onto writing their own code for the DSTR robot. They learned how to debug their program when they made programming mistakes. Students particularly enjoyed the ability to control their robots from their own cell phones.

Students working on control/electronics were responsible for the internal communication within the robot between the controller and the motors. They were instructed by Austin Carter.

They learned to wire the H-Bridge, Launchpad, battery pack, and motors together. An H-Bridge is an electronic circuit that enables a voltage to be applied across a load in either direction. The students also manipulated a piece of plastic which would hold all the wires together on the robot. This piece of plastic is called the sled. In order to complete these tasks, the students also learned soldering techniques and perfected these techniques throughout the week. This internal wiring was essential for internal communication across the entire robot.

Students focusing on mechanics built the frame of their robot under the directions of the instructor, Dakota Riggs. These students created the legs and the mainframe of the robot. This was the true skeleton of this piece of machinery.

By Wednesday night, all the groups were ready to put all the pieces of their DSTR robot together. Wednesday night and all of Thursday was dedicated working, by trial and error, to fix any problems their robot had. They also started racing their robot and attempting to go over hurdles.

Friday morning was the much-anticipated Race of Champions. This would be the time and place where all the students' hard work throughout the week would pay off and, in Dr. Morgan's words, would feel the thrill of victory or the agony of defeat. In order to win this race, the robot had to turn on two puck lights on the way to the end of the room, turn around, then turn off these puck lights. There were two heats of four teams each, then the top four and bottom four teams would race each other to determine who the winner of the Race of Champions was. While this was happening, each group was tested over mini-lessons, which covered the theory behind what made the robot run. The students left this race short of breath, relieved that their work was finally finished and proud of the taste of engineering they received.

The awards ceremony, which took place Friday afternoon, would be where the students would find out who performed the best over the entire week. The winner was based on four categories: the highest quality social media, testing over their STEM knowledge, who won the race, and how well their robot was built. Before the students heard their anticipated results, representative from Texas Instruments and MISL Media Relations Chair Stephanie Herman summarized the event that had occurred during the previous week and commended all the students for their dedication and hard work. Finally, it was time for the results. Third place was team TNT Racer with 43 points. Second place was team Earthquake with 43.5 points. First place was Tsunami with 44.5 points. Overall, no matter if the students won awards or not, those who participated in YAP Robotics workshop learned valuable lessons of the process of engineering and how satisfying the field can be.