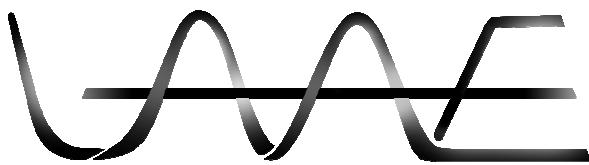


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From Intro to Robotics Amateurs to National Competitors

Students from Los Altos High participate in ION's Mini Urban Challenge.

By: Kimberly Hsu

At the first Regional Competition held in the John Deere Building in California on March 24, two teams from the Los Altos Academy of Engineering experienced their second robotics competition. Team 1 consisted of juniors Jerry Wang, Kevin Morales, Marcos Avila, and Kimberly Hsu; seniors Nick Pung and Ivan Wang; and former senior Samuel Chia. Team 2 consisted of sophomores Kenneth Hirscht and Michael Chang, both of whom were currently enrolled in the Introduction to Robotics class at Los Altos High School



Team 1 at Nationals Left to Right: Marcos Avila, Samuel Chia, Kevin Morales, Ivan Wang, Nick Pung, Jerry Wang, Kimberly Hsu

at that time. Both teams had created their own customized robots and programmed them according to competition rules in order to autonomously navigate through the large Lego city. Team 1 would then progress to the national competition in the National Museum of American History in Washington D.C. on May 26.

The students were first introduced to ION's Mini Urban Challenge through

Joan P. Inouye. The competition sparked the LAAE students' interests because a new type of opportunity to succeed was available. Not only would this competition incorporate what they had learned in Introduction to Robotics, but also expand upon their current programming knowledge by experimenting with new elements within the programming language RobotC. This knowledge was put to the test in the Regional Competition where the teams were required to create a robot using an NXT robot brain, Lego parts, and color sensors. The robot would then have to navigate without any human interference through a scale model of a city. The robot

was required to follow traffic rules by reading color values and carrying out the specific programmed reaction.

In addition to having the robot autonomously navigate the scale model city, both teams were required to present their robot in front of a panel of judges. Mr. Mitch Kodama, a key supporter, visited LAAE a few weeks prior to the regional competition to provide advice on both teams' presentations. For Teams 1 and 2, the presentation would potentially be the determining factor between earning first, second, third, or no place at all. Both teams had already experienced difficulties on the competition mat. "During the one hour period to test the robot and score points, we continuously made changes to the robot's program in order to maximize efficiency. We had trouble deciding whether to choose the untested program that could potentially score a lot of points or the program with the simplest route that didn't score as many points," Marcos Avila says. Team 1 took second place and earned the Best Presentation Award while Team 2, although not winning any awards, was able to go home with the priceless rewards of knowledge and experience.

On May 26, LAAE Team 1 participated in ION's Mini Urban Challenge in Washington D.C. at a national level. They were confident in succeeding for a second time. Their robot had undergone new structural and programming changes prior to the national competition. This time all of the participating teams faced difficulties in the robot navigation section of the competition. "The dim lighting within the building made it hard to calculate exact color values. Some parts of the mat were illuminated while others were not. I could see robots from other teams spinning out of control because of this difference," Nick Pung states, "We weren't sure who was going to win at this point. All we knew was that now the presentation was vital to the final scoring." Teams from across the country, including LAAE Team 1, patiently waited for the last point to be tallied.

Although LAAE Team 1 did not win an award, its members knew that if they had come this far with all their efforts, they could do it again. Members of Team 1 did not return home with their heads lowered, but with confidence that the experience gained from this year's competition would be valuable for next year's competition. Ivan Wang proudly stated, "I hope we can once again advance to the national level. But this time we'll be familiar with the playing field and we're confident to place in the top two."

Pulse's Shell

By: Derek Ho

Students use composites to build Pulse's shell.

One of the rules in the Electrathon America rulebook that Project Pulse abides by states “All vehicles must provide a body/chassis structure sufficient to protect the driver from any side. A suitable structure or shell is required to provide a barrier between the driver and any contact with another vehicle or the ground.” To fulfill this requirement, the Composites team of the Los Altos Academy of Engineering has sent several members to Cerritos



Ashley Ho prepares to build the cross section model of Project Pulse.

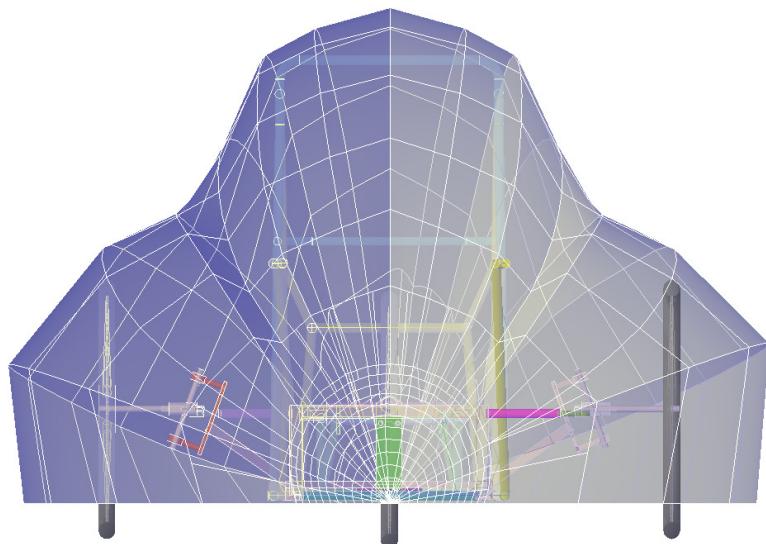
College to obtain knowledge about composites from Mr. Terry Price and Mr. Fergus O'Farrell, both of whom teach the class, Plastic Manufacturing Technology for Fiberglass Fabrication, PMT 61. Mario Gonzalez, graduated senior; Thomas Shaihor, graduated senior; Alanna Ho, senior; Ivan Wang, senior; Ashley Ho, junior; and Alisa Smanpongse, junior carools to attend the class once a week. These members are currently making scale models of Pulse before constructing the actual body. The Composites team hopes to have Pulse's final body finished before February in time for the competition in April at the Emerald Coast Electrathon, Florida.

PMT 61 has taught the six members many helpful techniques such as vacuum bagging, nomex honeycombing, and core-bonding. Certain techniques provide the vehicle with stronger stability and better efficiency. These composite skills reduce weight, have an excellent corrosion resistance, dimensional stability, and reduce the cost of the process of making the vehicle's shell,” Smanpongse stated. An excellent corrosion resistance would allow the vehicle to run even in its later years while a reduced weight would increase the vehicle's speed, benefits which improve the efficiency of the vehicle. “Vacuum bagging is one of the several ways to efficiently make the body of the Pulse vehicle,” Wang explained. “Using atmospheric pressure as a tool, the process of vacuum bagging laminates simple molds into a wide range of functional shapes by removing the air that could potentially weigh the vehicle down. There is much more

that can be done with the new composite knowledge.”

Cerritos College had helped the Los Altos Academy of Engineering in 2006-2007 as well. Price also helped LAAE construct the body of the Infusion vehicle. LAAE is grateful for all the help from Price, O’Farrell, and Cerritos College have provided. Wang says, “I want to create a larger base for my career as I plan to study chemical engineering.” Ho explained, “Not only do these skills help in Project Pulse, but they are also useful in the real world especially with airtight products.” The team’s expansion in both members and knowledge, will determine the success of Project Pulse.

While students from the Composites team are making the model, they still go to Cerritos College every Monday from 6 P.M. to 10 P.M. to learn from O’Farrell. LAAE intends to use the new knowledge to construct the body of Pulse. The Composites team is building two models of different sizes to exactly replicate the body of the vehicle. The two models allow LAAE to more easily visualize and build the vehicle. The body of the first model is built on a one-to-one foot scale and should look similar to the actual vehicle. The second model is built on a one-to-five foot scale with one being the model and five being the actual vehicle. The models will be made using cross sections, which outline the body of the vehicle. Project Pulse is progressing toward Florida’s competition.



Design of Pulse’s Shell front view

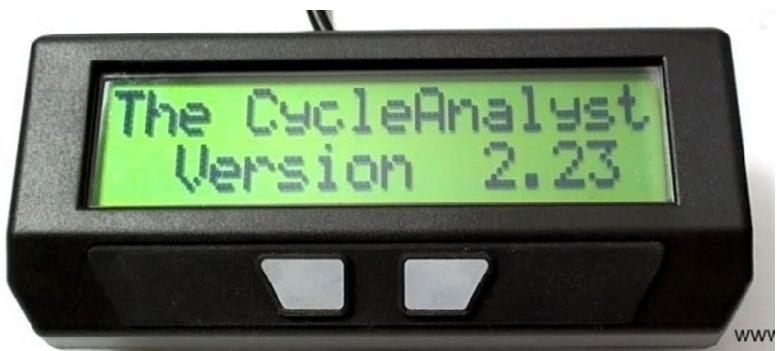
The Use of Telemetry

LAAE students use modern technology to make the driver safer.

By: Robin Gao

LAAE has been working on Project Pulse, its new electric vehicle, and has incorporated a strategy called telemetry. Telemetry is the observation and analysis of electrical data at a distance. It was introduced to the IT (Information Technology) team by Mr. Robert Franz to improve driving safety. By using the Cycle Analyst, which is an electrical component that measures voltage of the battery and other information, the team will be able to receive information from the car wirelessly. The shifter will convert TTL from the Cycle Analyst into serial data and wirelessly send the data to the serial port located on a computer. The team also developed a program to display all of the information. The data allows for the team to tell the driver how to drive more efficiently and avoid being distracted from the road. For instance, if the voltage is relatively high, the team will tell the driver to accelerate the vehicle. If the voltage is relatively low, the team will tell the driver to slow down in order to save more energy. It took the team one month to develop the telemetry program written in Visual Basic 2010 (VB). Live video feed from cameras installed in the vehicle will view the road and driver. The computer programmer uses wireless communications sent from the computer to the solenoid within the electrical system to shut down the vehicle during an emergency.

Through telemetry, the driver will be able to drive safer and more efficiently, and concentrate on the road condition.



Cycle Analyst provides information about the battery and other critical information.

A Word from our Adopt-an-Engineer Fundraiser Sponsors

Thank you to the following people for your generous donation and words of encouragement.

Gino Kwok:

“Thank you for making our spirits soar through the power of imagination.”

Vern Moyer:

“I wish you the best of luck with your plans.”

Norma Manning:

“Proud of your program.”

Brad Manning:

“I wish you the best with the “Pulse” car in Florida good luck!”

We would also like to thank the following:

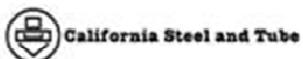
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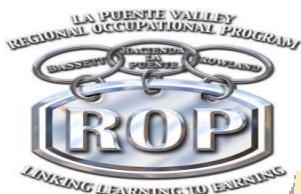
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