



*Creating a cleaner, more fuel efficient tomorrow.*



*Speed Racer, driven by Jacob Barron, makes a turn on the track.*

### California Challenge

*LAAE students compete in the California Challenge at Irvine.*

By: Kimberly Hsu

Continuing forward from last spring's Emerald Coast Electrathon, students from the Los Altos Academy of Engineering participated in the California Challenge at Orange County's Great Park in Irvine on October 4-5. The competition allowed college and high school teams from all over the nation the opportunity to compete. Two LAAE teams consisted of Michael Valdez, Matthew Barnes, Jacob Barron, Diego Carrillo, Ivan Zelada, Kevin Wang, Kenneth Hirscht, Isaac Silva, and Paul Shubin. Advisors Ed Richter and Jeff Hess accompanied the students. Because the California Challenge rules closely reflect the Emerald Coast Electrathon's rules, LAAE students were able to take 20 year old electric vehicle Speed Racer as well as the new vehicle Pulse to the race.

October 4 marked inspection day for the team. However, because the students only had six weeks to prepare and the weather delayed the start of inspection to 2:00 p.m, only a few teams qualified their vehicles that day. LAAE had to move vehicle inspection to the next day.

*The Los Altos Academy of Engineering begins a new year here at Los Altos High School.*

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Even though the teams ran into problems, California Challenge advocates Professor Michael McCarthy, Richard King, Gregory Washington, and several other benefactors helped LAAE's team sort out various technical difficulties. On the morning of October 5, the LAAE team was able to qualify both Pulse and Speed Racer. In the first heat of the race, Speed Racer placed as one of the top three teams, completing 15 laps around the track. However, a problem arose in the second heat though. Speed Racer's chain continuously popped off the motor. Eventually Speed Racer was taken off the track but managed to complete two laps around the track. On the other hand, Pulse was able to qualify but unable to race because of an electrical malfunction within the system; as a fuse kept breaking on the vehicle.

In the end, both LAAE teams did not place, but this race turned out to be a very valuable learning experience to LAAE students. "We can use mistakes that were made on Pulse to prepare ourselves for future vehicles. This race also challenged our ability to work around problems such as bugs within the electrical system or figuring out a shell for Pulse," says Jacob Barron. With these new experiences, LAAE students are determined to participate in future electric vehicle races as well as further their knowledge of the application of Design, information technology, mechanical, electrical, composites, and public relations toward various industries.



*Two figures made as a demo for our three-dimensional printer*

### Three-Dimensional Printer

#### *LAAE receives a new 3D Printer*

By: Michael Valdez

This past August LAAE received a three-dimensional printer. "This is a big step for the program," says Design Team member, Kaitlyn Eng. "We can now test the concept design before testing the finished product". This machine can make a three-dimensional model of any design that the students can program into Solids Works. Gary Kulper, sales representative for Stratasys, visited the LAAE in September and demonstrated how to properly operate the machine.

The three-dimensional printer functions by illustrating graphic designs from a computer program called Solid Works. It allows the device to translate the 2D drawings into a physical object. After fabrication, the product is then placed into a specialized washing station to remove the excess material. The process of printing a 3D object can take up to five hours or more for each run, plus a lengthy eight hour clean-up. and create scale models of projects.

These scale models can be tested in a wind tunnel. Most importantly, Wind tunnel testing the models can give us data for the coefficient of drag. This is a variable in Power Calc. This equation used by

our students with variables such as weight and voltage to learn the wattage required for a vehicle to maintain constant velocity. The coefficient of drag is very important for our vehicle design as it expresses the drag of the vehicle moving through the air. In past years, the LAAE used outside sources to determine coefficient of drag; this can be a somewhat inaccurate method. The three-dimensional printer could aid us in greatly improving the design and efficiency of future vehicles.

### **Robotics Competes Yet Again in National Mini-Urban Challenge**

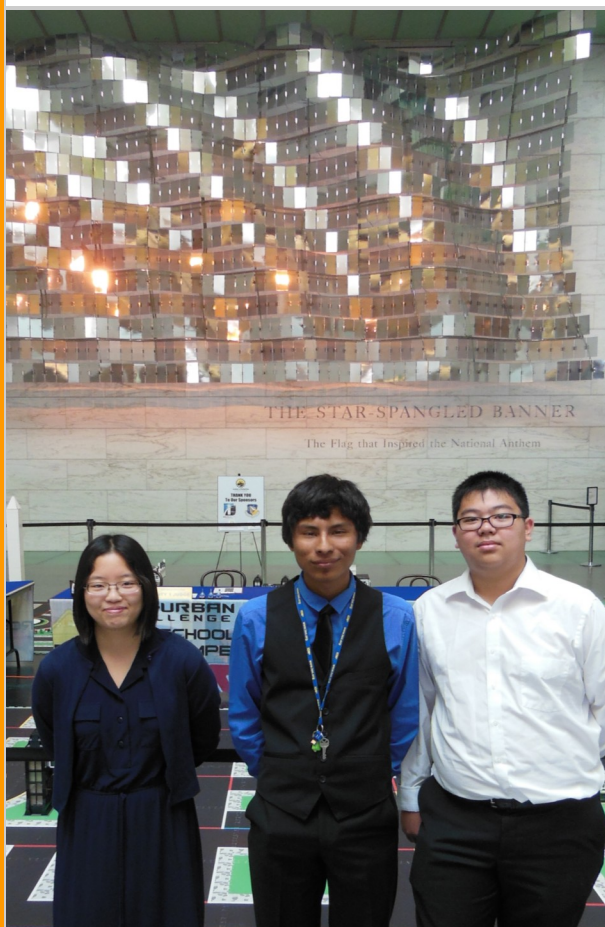
*This is the second year in a row that Robotics has competed in National MUC*

By: Kimberly Hsu

On June 6, students Kimberly Hsu, Marcos Avila, and Jerry Wang from the Los Altos Academy of Engineering robotics team competed in the National Mini-Urban Challenge at the Smithsonian Museum of American History In Washington D.C. The competition took place directly in front of the Star Spangled Banner. Thousands of people who came to see the flag were curious about the competition. This marked the second time, as well as second year in a row, that the LAAE robotics team had advanced to nationals. At the 2013 Mini-Urban Challenge regionals, the robotics team placed second and Best in Show with a robot named Tanky.

At nationals, the robotics team made a new shell for their robot as well as changed Tanky's name to Nova. This year's rules were the same as last year's: Build and program an autonomous robot that will navigate through a city-like course. The team scored four parking spaces within the course, but also received two penalties for bumping into other obstacles in the city.

"At first we tried integrating sonar into the robot, but later realized that it created another level of difficulty in programming. Objects came in such close contact with the robot that sonar would interrupt the robot's navigational course," says Marcos Avila. Although the robotics team did not place at nationals, the students appreciated the experience. "Other teams really stepped up their game this year. People were focusing more on programming though. This can give us an edge as we got Best in Show in regionals," says Jerry Wang. The robotics team, now consisting of seniors, is determined to participate once again in the 2014 Mini-Urban Challenge.



*Left to right: Kimberly Hsu, Marcos Avila, Jerry Wang.*

*Behind them is the Star Spangled Banner.*



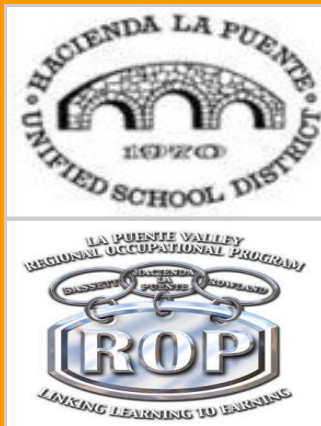
## THANK YOU SPONSORS



# Los Altos Academy of Engineering 2013-2014



Thank you Adopt-An-Engineer supporters. With your generous support, Los Altos Academy of Engineering students were able to race in the Emerald Coast Electrathon and gain valuable knowledge through this experience.



## Upcoming Events

First Tech Challenge: Nov 16

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