Lidar Technology Contributes to Victory for Edinburgh University Formula Student Team

The Edinburgh University Formula Student team recently won the UK's first autonomous race car competition. The multidisciplinary team of more than 50 members joined over 3,000 other students at the UK's Silverstone circuit to compete in Formula Student, the world's largest annual educational engineering contest. Advanced Lidar technology was involved in this milestone achievement.

Formula Student challenges university teams from around the world to each design, build and race a single-seat race car. This year an additional competition, Formula Student - Artificial Intelligence (FS-AI), was added, tasking students with developing AI software for a driverless race car.

Mapix technologies

Sponsoring the team at Formula Student was Edinburgh-based Mapix technologies Ltd. As well as providing regular mentoring and technical support, Mapix technologies also supplied the team with crucial hardware for their driverless race car challenge bid.

Included was the loan of a Velodyne VLP-16 PUCK, a 360° horizontal field-of-view Lidar sensor with a 100m range, 16 laser channels and up to 600,000 points per second. This sensor was installed on a self-driving car provided by the contest organisers, the Institution of Mechanical Engineers (IMechE).

As the UK distributor for Velodyne, Mapix delivers Lidar-based sensors and system integration for Jaguar Land Rover, Renault, Oxbotica and other vehicle manufacturers working in the field of automation. Mapix has also pioneered the application of Lidar in 3D mapping solutions specifically for use on drones, under the Routescene brand.

Software stack

Edinburgh University Formula Student developed the software stack for the driverless car over two semesters, and between their regular studies. A first round data collection lap was carried out before the car embarked on its maiden, fully autonomous circuit the following day as part of the 'dynamic events' aspect of the challenge.

Despite the car itself only being unveiled the week of the event and the Edinburgh team having only three days to familiarise themselves with the vehicle, they completed a full lap of the custom designed 'Track Drive' circuit.

In addition to this, a trio of 'static events' tested the team's commercial skills and knowledge. These included a design presentation, a business presentation and an overview of real-world autonomous vehicles. Competing in all three events, Edinburgh University Formula Student scored the most points in the 'Dynamic Driver Test' (software-only) class.

For their performance across both static and dynamic tests, the team was awarded best in class, fending off competition from around the world. Having solidified the leading position at the UK's first-ever driverless race car competition, they are already looking ahead to sustain it next year.

Huge achievement

Team member Oliver Day, who has just finished his first year at the University, said: "Formula Student has been a truly amazing journey for me. It has allowed me to apply the ideas I've learned in the classroom on a real-world project and gain experience in hands-on system design and teamwork. Seeing the car move by itself for the first time was thrilling and made all the hard work worth it. Now I am all the more excited to see how far we can go next year."

Gert Riemersma, CEO of Mapix, said: "This is a huge achievement for Edinburgh University Formula Student. The contest is a fantastic and proven conduit for students looking to begin careers in the automotive industry. Now, with more and more manufacturers harnessing the potential of autonomous technology, having an element of the contest dedicated to driverless software has massive relevance.

"As the UK's distributor of Velodyne, it's been great to promote the use, application and efficacy of the VLP-16 PUCK at Formula Student.

Likewise, being able to work with students at the grassroots level has been especially satisfying. I look forward to continuing to work with the team over the coming months in anticipation of next year's bid."