ACC 2024

QUANSER
INNOVATE · EDUCATE

2024 ACC

SELF-DRIVING CAR STUDENT COMPETITION

UPDATE

2024 AMERICAN CONTROL CONFERENCE SELF-DRIVING CAR STUDENT COMPETITION

POWERED BY QUANSER

AWARD OVERVIEW

We welcome all engineering faculty to encourage their students to participate in the Self-Driving Car Student Competition during the American Control Conference in Toronto, **July 10 – 12, 2024.**

1 STAGE 1 : VIRTUAL DESIGN & SUBMISSION

Each team will be given a virtual environment compatible with the on-site demonstration; each team will have access to a virtual representation of vehicle models provided by Quanser. A list of tasks will be provided for each team to work on their designs and to test and verify their solutions. Each team will submit their conceptual plan at the end of this Phase.

2 STAGE 2 : ALGORITHM VALIDATION ON PHYSICAL VEHICLES

After judging the outcomes of Stage 1, a short list of 6-8 qualifying teams will be sent a physical QCar, allowing them to transfer their code from the virtual environment to the physical self-driving car and provide the opportunity for algorithm validation and refinement before the in-person competition.

3 STAGE 3 : ON-SITE DEMONSTRATION AND COMPETITION

the shortlisted teams will be invited to attend ACC 2024 in Toronto and participate in the on-site competition.

SELF-DRIVING CHALLENGE

The organizing committee has configured the self-driving challenge to highlight critical Control Systems concepts that will focus on real-time decisions feedback control systems that will result in faster and more precise driving performance. The tasks include but are not limited to:

- Time to complete the path (circuit)
- Accuracy of driving
- Timely reactions to stop signs and traffic lights
- Avoidance of obstacles
- Develop a map which defines the world the car is driving in
- Identify key objects in the environment and place them on the world map
- Demonstrate aspects of self-driving while generating this world map

QCar

SENSOR-RICH AUTONOMOUS VEHICLE FOR SELF-DRIVING APPLICATIONS

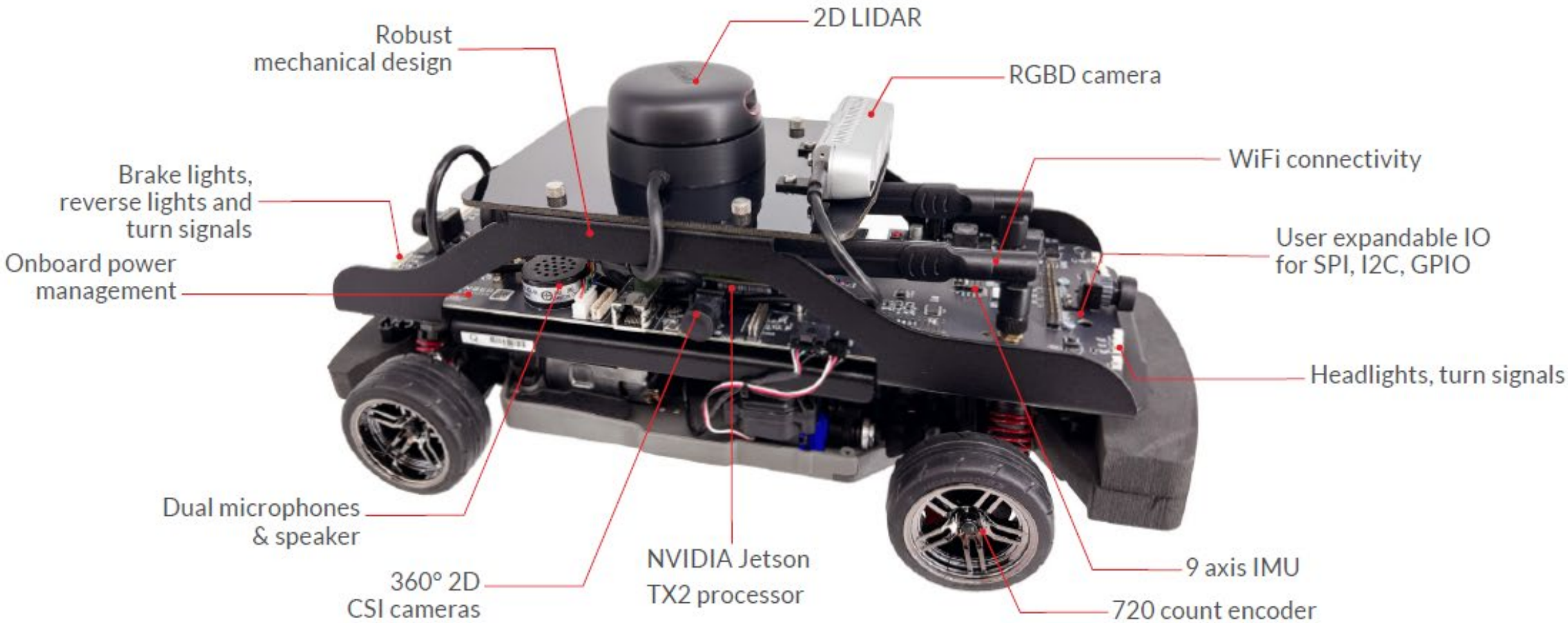
AUTONOMOUS SYSTEMS & APPLIED AI

AUTONOMOUS VEHICLE CONTROL | MOBILE ROBOTICS

QCar, the feature vehicle of the Self-Driving Car Studio, is an open-architecture, scaled model vehicle designed for academic teaching and research. It is equipped with a wide range of sensors including LIDAR, 360-degree vision, depth sensor, IMU, encoders, as well as user-expandable IO. The vehicle is powered with an NVIDIA® Jetson™ TX2 supercomputer that gives you exceptional speed and power efficiency.

Less

Product Details



QLabs Virtual QCar

HIGH FIDELITY DIGITAL TWIN IN AN INTERACTIVE DRIVING WORLD

AUTONOMOUS SYSTEMS & APPLIED AI | MOBILE ROBOTICS | SELF-DRIVING VEHICLE CONTROL | SOFTWARE | VIRTUAL EXPERIMENTS

The Quanser Virtual QCar is a fully instrumented, dynamically accurate digital twin of the Quanser QCar system. It behaves the same way as the physical hardware and can be measured and controlled using the Python, ROS, and MATLAB Simulink development environments.

With a reconfigurable and visually rich environment that mirrors the physical Self-Driving Car Studio, it can enrich your lectures, labs, research, and outreach activities. Beyond the classroom and research lab, the platform offers the capacity to give students skills-based leaning experiences in a blended and/or hybrid configuration for distance and online courses.

Pasos a seguir en CULagos

1. Solución de retos de robótica (sigue líneas, solución de laberinto, toma de decisiones), en espacio de robótica (aula C1).
2. Integrar equipos para Self-Driving Car Student Competition
3. Desarrollar propuestas para Stage 1.
4. En caso de avanzar a Stage 2, todos los participantes apoyarán a los seleccionados a poner a punto el sistema.
5. Ganar en Stage 3.

Fechas importantes

- Registration: Until February 29, 2024
- Stage 1: Until April 30, 2024
- Stage 2: Until June 30th, 2024
- Stage 3: Competition details and guidance will be released in the first week of July 2024

Enlaces relacionados a la competencia

- https://www.quanser.com/community/student-competition/2024-student-self-driving-car-competition/#msdynttrid=zQ6f2I3i-DUCpG_ST8BIBq3tAsOdQbO4bTi8BxyB67g
- https://www.quanser.com/products/qcar/
- https://www.quanser.com/products/qcar/#details
- https://www.quanser.com/products/qlabs-virtual-qcar/

¿Preguntas?

Take a look at FAQ before you contact us!	
Q: Is having a faculty member or professor on the team mandatory?	A: We suggest having a supervising professor on the competition team who may help coordinate resources and orchestrate progress.
Q: What is the maximum number of members in the competition team?	A: We do not have a specific limit on the number of people on each participating team, and team composition is based on the best combination that will accomplish the task. Based on the 2023 competition's experience, a team has an average of 5 members.
Q: Do we need to provide details of all team members?	A: Yes, we will email the supervising professor to follow up.
Q: How do you ensure that teams are updated with timely information?	A: First, we strongly recommend nominating a Team Captain, and we will contact your Team Captain via email. Secondly, please connect with us through LinkedIn, where you can find the most updated information on the competition.
Q: How can I get in touch if I need advice on technical issues?	A: Please email your specific requirement to studentcompetition@quanser.com. A dedicated Quanser engineer team will review and reply.
Q: Is there a fee for the teams to join the competition?	A: Registration and participation in the competition are complimentary. Teams advancing beyond Stage 1 will be responsible for their travel expenses and ACC conference registration during Stage 3 on-site competition in Toronto.
Q: Do all team members need to attend Stage 3 in Toronto if they qualify?	A: We understand that some team members may have visa issues to travel to Toronto. A possible solution is to let some team members join Stage 3 remotely while others go to the live event in Toronto.

Profesores

- Dr. Juan Onofre Orozco López
- Dr. Jesús Ricardo Sevilla Escoboza
- Dr. Roger Chiu Zarate
- Dr. Miguel Mora González
- Dr. Roberto Rafael Rivera Durón
- Mtro. Miguel Salvador Soriano García
- Ing. Josué Mauricio Rodríguez Ornelas