



INDY AUTONOMOUS CHALLENGE

FREQUENTLY ASKED QUESTIONS

THE CHALLENGE

What is the Indy Autonomous Challenge (IAC)?

The Indy Autonomous Challenge, organized by Energy Systems Network (ESN) and the Indianapolis Motor Speedway (IMS), is a \$1.5 million prize competition among universities to program autonomous-modified Dallara IL-15 racecars and compete in the world's first head-to-head race at speeds of up to 200 mph around the famed IMS on October 23, 2021.

What is the mission of the IAC?

The IAC taps into the power of incentive prize competitions to inspire the best and brightest in universities worldwide to eliminate barriers to innovation, overcome complex challenges, and increase public awareness of the transformational impact that automation can have to improve vehicle safety and performance.

The primary goal of the challenge is to advance technology that can speed the commercialization of fully autonomous vehicles and deployments of advanced driver-assistance systems (ADAS). These enhancements will lead to increased safety and performance in all modes of racing and commercial transportation.

Importantly, the IAC promotes Science, Technology, Engineering, and Math (STEM) while advancing autonomous vehicle commercialization by helping to solve “edge case” scenarios—problems that occur only in extreme operating environments, such as avoiding obstacles at high speeds while maintaining vehicular control. Running autonomous vehicles at very high speeds of up to 200 mph is an exhilarating platform to test new technologies.

Whose idea was the IAC?

The IAC builds upon the successful impact of the 2005 DARPA Grand Challenge, which led to expanded R&D in technology for autonomous vehicles. Sebastian Thrun, who led the winning team, is serving as a key advisor to the IAC.



Who are the primary organizers?

Energy Systems Network (ESN) and the Indianapolis Motor Speedway (IMS) are the primary organizers of the IAC, supported by a consortium of public and private partners and sponsors. Collaborators include ADLINK, Ansys, Aptiv, AutonomouStuff, Bridgestone, Clemson University’s International Center for Automotive Research (CU-ICAR), Microsoft, New Eagle, PWR, RTI, Schaeffler and Valvoline, in addition to the Indiana Economic Development Corporation, and Dallara, producer of the modified IL-15, which serves as the base IAC racecar that each team will use.

For more information on the IAC sponsors, visit the [IAC website](#).

Who provided the prize purse?

The \$1.5 million prize is funded by a consortium of public and private companies involved in the IAC, led by ESN and IMS. In addition, Ansys is providing additional awards for winners of the simulation race, scheduled for early 2021.

What are the rules of the Challenge?

The IAC is a competition among accredited tax-exempt universities worldwide to create software that enables automated-capable racecars to compete and aspire to finish first in a head-to-head race on the IMS’s famed oval. The competition is normalized around software. Teams will not be asked to develop and produce automated vehicle computers, sensors and other hardware. Instead, the focus is on developing new generations of software that can ensure precision control of vehicles at high speeds during the competition and reduce fatalities on public roadways afterwards.

Official Rules can be found on the [IAC website](#).

Will this be an annual challenge or is this a one-time technology demonstration?

ESN and IMS have not announced future plans for IAC activities beyond October 2021.

THE INDIANAPOLIS MOTOR SPEEDWAY

Why is the IAC race at the Indianapolis Motor Speedway (IMS), which hosts the world’s best racecar drivers at the largest annual sporting event in the world: The INDY 500?

The IMS has been an incubator and proving ground for automotive innovation since it opened in 1909 and will provide the same critical value for the Indy Autonomous Challenge. The famed IMS oval is the most prestigious racing stage in the world and will push the limits of performance and safety for this autonomous head-to-head race.



What is the distance the cars must drive to win the IAC?

The winning team's car must complete 20 laps around the 2.5-mile Indianapolis Motor Speedway (IMS) oval for a total of 50 miles.

Will qualifying days for the IAC be available for public viewing?

Spectator decisions will be announced as dates draw closer, especially considering any COVID-19 considerations.

THE TEAMS

Who can enter the Indy Autonomous Challenge?

IAC entrants must be tax-exempt colleges and universities (including foreign institutions of higher education that are organized and operated in a manner consistent with requirements for exemption from federal income tax under the laws of the United States). Registration must be undertaken by a current faculty member, student, or staff member of an academic institution, pursuant to the authorization by the academic institution's leadership.

Who retains the Intellectual Property (IP) of the autonomous software developed by each team?

Each university team will retain ownership of the software they have developed for the IAC.

How many teams have entered the IAC?

Students from 37 universities that excel in AI software and autonomous vehicle engineering have registered to compete in the IAC. Some of the universities have joined forces to collaborate. This is a truly global challenge with universities from 11 countries on four continents, including 14 U.S. states.

Are IAC teams permitted to secure their own sponsorships?

Yes. The IAC teams are encouraged to secure their own sponsorships.



TEAM TRAINING & SIMULATION: IAC HACKATHONS

What training is being offered for the Indy Autonomous Challenge university teams?

Key to the success of preparing the university teams for the October 2021 IAC race will be a series of hackathons and workshops, organized by ESN, its collaborators and sponsors, beginning in May 2020. Due to COVID-19 safety restrictions, these hackathons and workshops have been conducted remotely, via live-stream conferencing.

What is the role of Ansys, global leader in engineering simulation software?

Ansys, a global leader in engineering simulation software, is creating a unique simulation platform based upon its industry-leading VRXPERIENCE Driving Simulator, powered by SCANer™, that is embedded around the IMS track and in the modified Dallara IL-15 vehicle models. It is providing all registered teams with this platform along with its SCADE software development suites, to allow the teams to develop and test their autonomous vehicle software in a virtual environment. In addition to providing the software packages, Ansys will conduct sessions to thoroughly train all students in the simulation solutions, as well as offering numerous self-help resources.

Ansys will also implement and execute the simulation race, scheduled for May 2021.

Will there be a prize for the simulation race of the IAC?

Yes, Ansys is awarding a \$150,000 prize to the top finisher of the simulation race.

THE RACECAR: The Modified Dallara IL-15

Are the teams engineering their own autonomous racecars or is there a dedicated racecar selected for the Indy Autonomous Challenge (IAC)?

The official vehicle that all IAC teams will use is a modified Dallara IL-15 racecar, which has been retrofitted with hardware and controls by Clemson University Deep Orange 12 (DO12) students to enable automation. Since 2001, Dallara has been the sole supplier of racecar chassis for the Indy Lights Series, whose main goal is to prepare young drivers for the NTT INDYCAR SERIES. See renderings of the IAC Dallara IL-15 racecar [here](#).

How are these modified Dallara IL-15 racecars powered?

Graduate students on Clemson University's Deep Orange 12 team will determine the appropriate powertrain to provide the sustained power levels required for racing at high speeds and generate the electrical power needed for onboard computing and sensing systems.



What sensors does the IAC Dallara IL-15 racecar have?

Clemson University's DO12 students are tasked with determining the sensor types and locations to provide the vehicle with computer vision at high speeds. Technologies under consideration include, but are not limited to, radars, lidars, cameras, and GPS sensors. Integration of these sensors on the vehicle is also a difficult challenge since vibration levels may be high and the presence of sensors will influence the aerodynamics of the vehicle. Aptiv is an IAC Vehicle Sponsor and will provide radar technologies for the IAC's vehicles.

How will the teams autonomously drive the modified Dallara IL-15 racecar?

Clemson University's DO12 students regularly seek input from IAC teams on the engineering of an autonomous-capable version of the IL-15 chassis to help ensure it can accommodate the IAC entrants' driverless algorithms. Teams are directly involved through monthly virtual design reviews (VDRs) and other feedback channels throughout the competition. The algorithms will complete all actions normally performed by a driver.

Will the teams have remote control capability?

Telemetry systems will be implemented to allow for vehicle condition monitoring by participants. This system will also allow the vehicle to be disabled remotely and brought to a controlled stop for safety reasons.

Who maintains the IAC team vehicles at the Indianapolis Motor Speedway?

While at the IMS, the IAC vehicles will be maintained and serviced by personnel approved and provided by ESN.

RACE TRIALS

Are there race trials planned for the IAC? When and where?

Track practice days are planned at the Indianapolis Motor Speedway (IMS) for June 5-6, 2021, Sept. 4-6, 2021, and Oct. 19-20, 2021. The final race qualification will take place at IMS Oct. 21-22, 2021. A timeline of events can be viewed [here](#).

Will the race trials be for public viewing?

More information about the viewing of the IAC race trials will be published on the IAC website as it becomes available.



PUBLIC PARTICIPATION & COMMUNICATIONS

How can I learn more about the race and teams from now until race day, October 23, 2021?

The IAC regularly updates its website with current information. In addition, we post press releases, blogs, and publish a monthly newsletter, The Leaderboard. To receive our communications, register on the [IAC website](#). Images can be accessed at <https://www.indyautonomouschallenge.com/visuals>

Do you have social media sites where I can interact with IAC and the teams?

Yes, you can follow us and the teams on social media using the handle @IndyAChallenge on [LinkedIn](#), [Twitter](#), [Instagram](#), [Facebook](#), [YouTube](#) and [Reddit](#). #IAC2021

How can I develop a fan club for my favorite team?

You can support your favorite team online in many ways. We encourage you to start a Facebook group, a Reddit subreddit, a fan account on Instagram, or by simply using the team hashtag in your posts.

Where and when can I buy tickets for the Indy Autonomous Challenge?

More information about the race and whether there will be public viewing options will be published on the IAC website as it becomes available.

MEDIA CONTACTS

Diane Murphy, National Media (Diane@AquariusGroup.net)

Raquel Bahamonde, Indiana Media (rbahamonde@cicpindiana.com)

Alex Damron, Indianapolis Motor Speedway (Adamron@brickyard.com)