

POLICY NEWS

The Indy Autonomous Challenge

The fastest autonomous racecar is coming to CES 2022.

The Indy Autonomous Challenge (IAC) Dallara AV-21 was virtually introduced to a global audience at CES 2021 seeking technologies that will change the world.

Inspiration for the IAC was the 2004-2005 DARPA Grand Challenge, which led to the advancement of new technologies and invigorated the prize challenge model of promoting innovation. The IAC is a \$1.5 million prize competition designed to engage worldwide university teams to program autonomous-modified racecars and compete in the first autonomous racing event at the famed Indianapolis Motor Speedway (IMS) — the Racing Capital of the World.

The IAC taps into the power of science, technology, engineering and math (STEM) and prize competitions to advance technologies to speed the commercialization of fully autonomous vehicles. The goal is to improve vehicle safety and performance, and increase public awareness of the transformational impact that automation has in our lives.

The primary organizers of the IAC are Energy Systems Network (ESN) and the IMS, supported by a consortium of public and private partners and sponsors. CISCO is the IAC presenting sponsor, and contributing companies include: ADLINK, Ansys, Aptiv, AutonomouStuff/Hexagon, Bridgestone, Clemson University's International Center for Automotive Research (CU-ICAR), Luminar, Microsoft, New Eagle, PWR, RTI, Schaeffler and Valvoline, in addition to the Indiana Economic Development Corp., Juncos Racing and Dallara USA, producer of the IAC AV-21, the base IAC racecar for each team.

Since 1909, the IMS has been an incubator and proving ground for automotive innovation. The IMS oval will

push the limits of performance and safety for this autonomous race event scheduled for October 23, 2021.

University Teams

More than 40 universities, representing 11 countries on four continents, including 14 U.S. states, registered for the Indy Autonomous Challenge. The 30 teams will race their Dallara AV-21 racecars 20 laps hoping to win. The IAC advances autonomous vehicle commercialization by helping to solve “edge case” scenarios — problems that occur in extreme operating environments, such as avoiding obstacles at high speeds while maintaining vehicular control. Importantly, the competition is normalized around software. Teams do not develop or produce the racecar or any of the automated vehicle computers, sensors and hardware. Instead, the IAC teams focus on developing software using artificial intelligence (AI) to ensure precision control of vehicles at high speeds during the competition, hoping one day to also reduce fatalities on roadways.

Team Training and Simulation

Key to the success of preparing the university teams for the October 2021 IAC race is a series of hackathons and workshops, organized by ESN, its collaborators and sponsors, that began in May 2020. These simulations are orchestrated by Ansys, which has created a unique simulation platform based on its industry-leading VRXPERIENCE Driving Simulator, powered by SCANer™. On June 30, Ansys ran its final simulation

race and awarded \$100,000 to the first-place winner, PoliMOVE, and \$50,000 to TUM Autonomous Motorsport, the runner-up, in this critical simulation race milestone.

The Racecar: The IAC Dallara AV-21

The official vehicle the teams use is the IAC Dallara AV-21, which has been retrofitted with hardware and controls to enable automation. Since 2001, Dallara has been the sole supplier of racecar chassis for the Indy Lights Series, which prepares young drivers for the NTT INDYCAR SERIES.

The IAC Dallara AV-21 is the most technologically advanced, fastest autonomous racecar with a bullet-proof package of equipment including a modified-for-autonomy Indy Lights chassis from Speedway's Dallara USA, a four-cylinder turbocharged beast of an engine, and Lidar, radar and optical cameras sensors. This equipment converges with screamingly quick on-board rugged-edge computing and communications, coupled with cutting-edge AI algorithms.

These advanced hardware and next generation software systems are synthesized to create the most optimized and powerful platform for safety, precision control and performance — the Dallara AV-21, a \$1 million technical marvel. ■



The Indy Autonomous Challenge Dallara AV-21 Racecar

GO ONLINE: Visit the IAC website and follow the teams: @IndyAChallenge on LinkedIn, Twitter, Instagram, Facebook, YouTube and Reddit/hashtag #IAC2021. The IAC will take place on October 23, 2021.