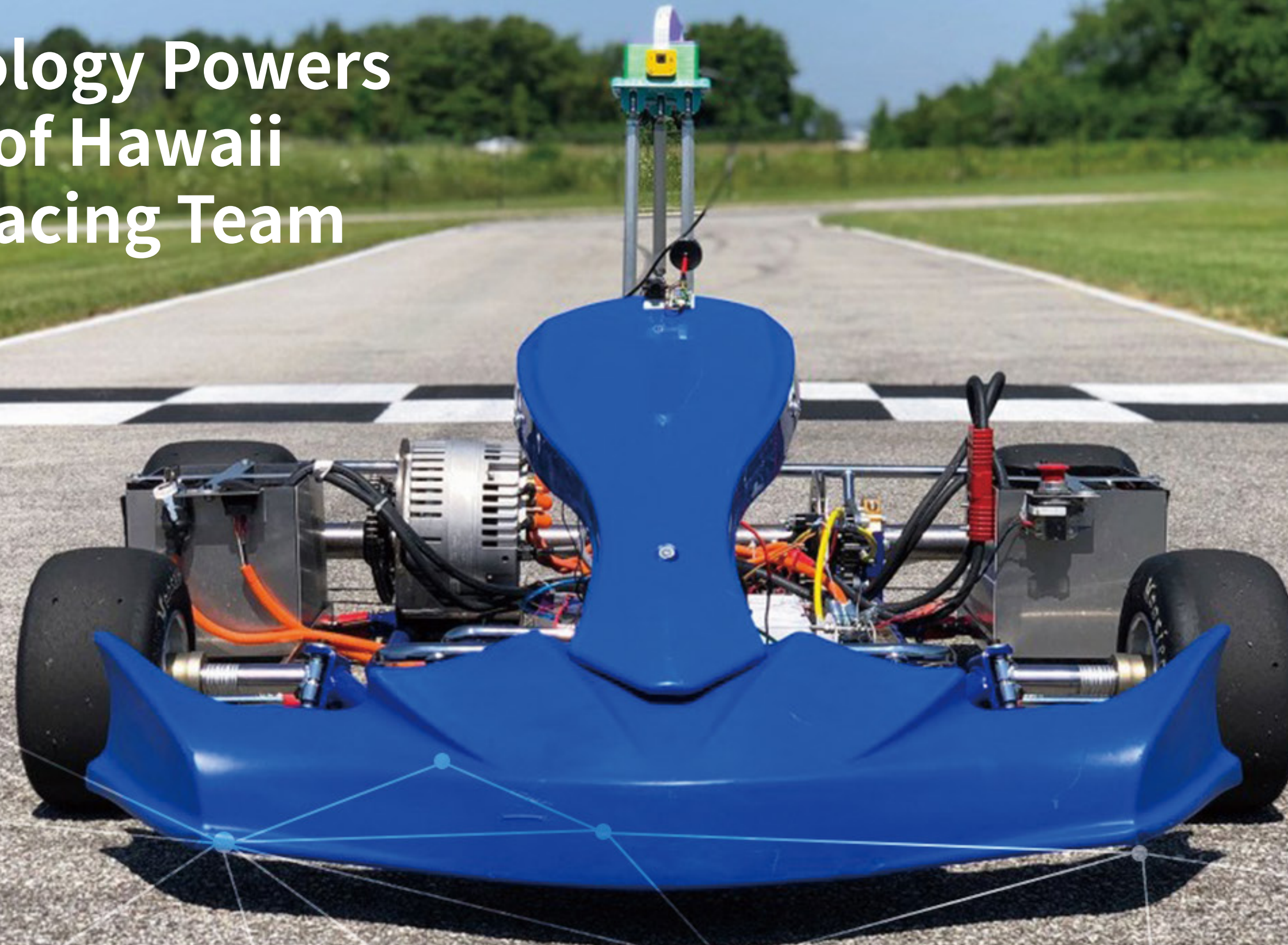


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 **ADLINK**  
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University of Hawaii  
**ADLINK Technology Powers  
the University of Hawaii  
Autonomous Racing Team**



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## Introduction

For the first time ever, autonomous race cars will push the limits of speed, traction and autonomy around the famous Indianapolis Motor Speedway, home of the Indianapolis 500. The race is scheduled for October 2021, with university teams from around the world jockeying for the opportunity to be selected to compete in this inaugural autonomous race event.

The University of Hawaii AI Racing Tech (UH ART) Team is one of the teams working to compete in the 2021 Indy Autonomous Challenge (IAC). The official competition takes place with full-size autonomous race cars at the Indianapolis Motor Speedway, on October 23, 2021.





## Challenges

The UH ART Team initially developed an evKart design to compete in the 2020 Purdue evGrandPrix University Autonomous Karting – Masters Division. The evKart autonomous vehicle is an electric go-kart platform with specifications borrowed from the evGrandPrix human-driven competition vehicle. The UH ART Team successfully qualified for the 2020 evGrandPrix competition, only to have the event cancelled due to Covid-19 precautions. The team plans to compete in the 2021 evGrandPrix, autonomous race with their race vehicle in April 2021. This event is one of the stepping stones to success in the INDY Autonomous Challenge(IAC).

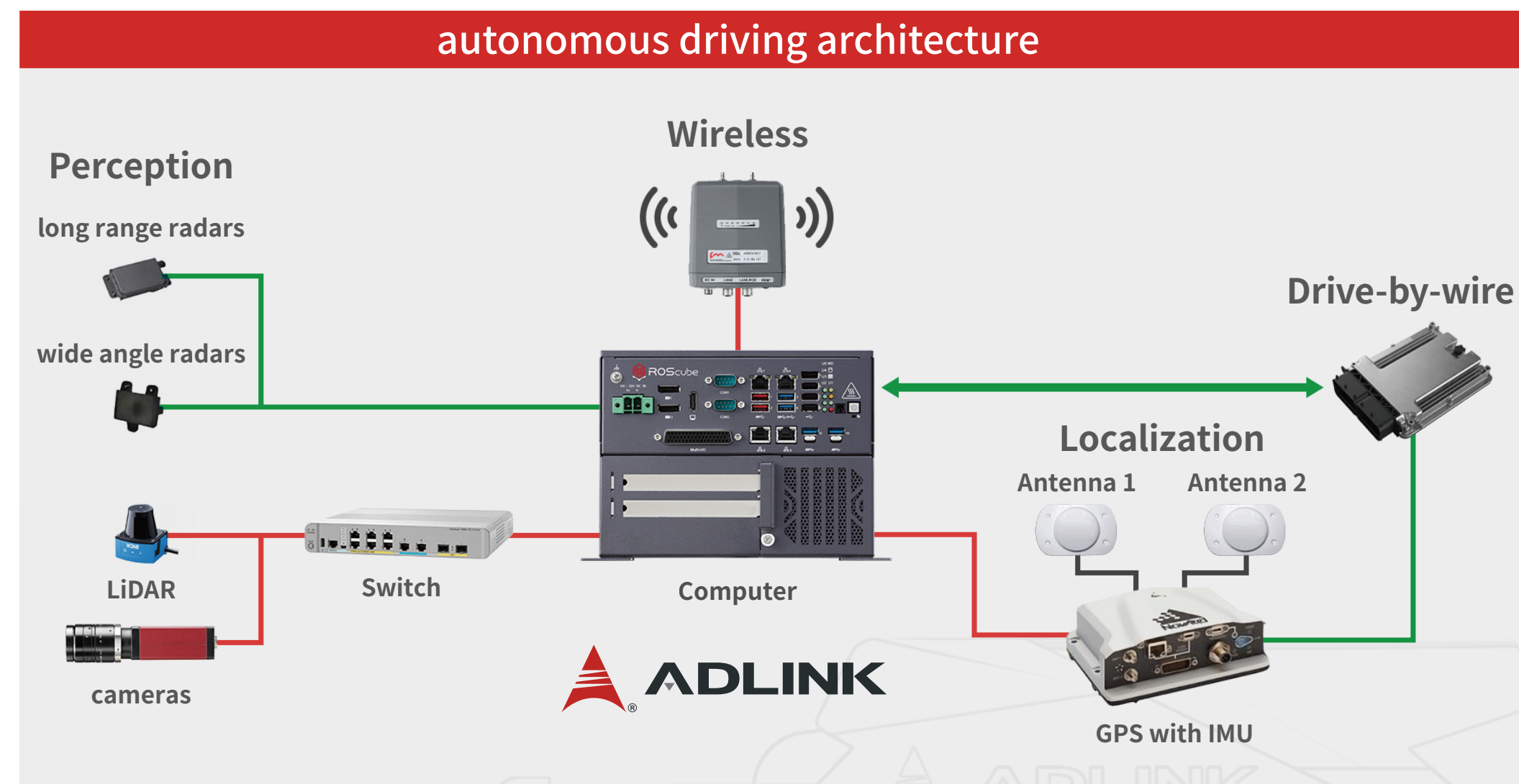
The goal of the IAC competition is to cross the finish line in 25 minutes or less (i.e., averaging  $\geq 120$  MPH) in a head-to-head, 20-lap (~50 mile) race of driverless Dallara Indy Lights vehicles around the Indianapolis Motor Speedway oval. The race track is unmodified for the IAC vehicles, and the teams are challenged to design racing algorithms and use sensor packages that can successfully navigate on any race track.





## Adopting ADLINK and Intel's technologies to speed time

The team started development with the Nvidia Jetson device for onboard vision processing and controlling the vehicle. The team installed an ADLINK ROScube, which incorporates a powerful Intel CPU as well as dedicated MXM slot for GPUs, in the fall and is now building their design around the ADLINK architecture.



The evKart autonomous kart uses vision cameras, GPS and inertial measuring units (IMUs) as the basic sensor stack. All of the computing power, processing, navigation and localization is done onboard the vehicle.





The UH ART Team has been working towards this competition since spring of 2020 and the team was formed by students who participated in the UH-Maui Autonomous Vehicle Technology class that year. ADLINK is one of the sponsors for the 2021 Indy Autonomous Challenge and the UH ART Team, providing the compute platform for individual team research vehicles as well as the actual competition race platform for the IAC race cars.

The Indy Autonomous Challenge is hosting the inaugural autonomous vehicle competition in October 2021. If successful, this will become an annual event at the Indianapolis Motor Speedway. The IAC's goal is to become the premier autonomous electric vehicle competition and its success follows on the heels of previous events such as the Purdue evGrandPrix and the DARPA Grand Challenge. The IAC race will field the fastest autonomous race car platform on undoubtedly the most famous race track in America.



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