



COMMUNITY COLLEGE OF ALLEGHENY COUNTY

Virtual Racing League: Engaging Students Remotely Using AI-Racing During a Pandemic

Community College of Allegheny County

Justin Starr & Robert Szymanski

As a two-year institution, the Community College of Allegheny County seeks to prepare students in the Greater Pittsburgh Area for careers that are in demand. As artificial intelligence has become increasingly commoditized, the college has offered a variety of programs in that area through our Data Analytics and Robotics programs. As an academic partner of the Mobility21 University Transportation Center, CCAC has also focused on curricula that supports careers in Intelligent Transportation Systems. Last year, the college ran an experimental course combining artificial intelligence, automotive and mechatronics concepts to simulate self-driving in traffic flow.

This experimental course would have required students to build remotely controlled “Donkey Cars”, drive them in order to gather sensor data, use that data to build a model and ultimately engage in autonomous driving on a test track – avoiding other vehicles and responding to traffic control signals. Unfortunately, the COVID-19 pandemic made it impossible for this course to achieve all desired learning outcomes when the college shifted to remote learning.

While the pandemic had a clear impact on learning, students also report a sense of isolation and actively seek connections to others during times of social distancing and Zoom-based courses. To facilitate collaboration between students and continue to foster an interest in AI and Intelligent Transportation Systems, the college is using the Donkey Car Simulator to develop and deploy a Virtual Racing League (VRL) to students on multiple campuses.



Donkey Car is a high-level, self-driving library written in python. It was developed with a focus on enabling fast experimentation and easy contribution. It typically utilizes a physical R/C car and associated controller to acquire images and data to train a self-driving model. In recent months due to the COVID-19 pandemic, the community developed a simulator to provide the necessary

environment to collect the necessary for construction of a self-driving model. CCAC is leveraging these resources to enable students to construct their own self-driving models and use them in an online DIY Robocar Competition. By hosting the simulator on the College’s servers, students can compete against one another in a VRL. Initial efforts are focusing on using the VRL in the West Hills Center campus, but the league will be rolled out to the other campuses in 2021.

In this VRL, CCAC plans to create an extracurricular event that will enable students in multiple locations to train and race AI-enabled cars against their peers. We will develop a quick start tutorial that will enable students to download the Donkey Car platform and begin simulating on a local machine, and provide access to the hosted server for open races and testing. Near the end of each semester, campuses will host races to determine the best model, and finally an intra-campus race will determine a college-wide champion.

CCAC also plans to extend this into our pipeline of high schools, inviting schools to create a virtual race team, train their model, and submit it for competition. At the cessation of the pandemic, we hope to merge this virtual league into a physical racing program, but we also plan to explore unique collaborations at a distance that are enabled by a simulated environment.