OPTICAL TRACKING FOR ROBOTICS & AUTONOMOUS VEHICLES TESTBED

How the University of Cambridge merged optical tracking and a fleet of miniature cars for an experiment in cooperative driving

Amanda Prorok, Assistant Professor and University Lecturer, from the Department of Computer Science and Technology at the University of Cambridge, runs a research lab designing algorithms for coordinating systems composed of multiple autonomous robots.

The Issue

Amanda Prorok approached Target3D when she was seeking to track multiple vehicles in order to feedback information to algorithms to help control the vehicles autonomously and was struck by a lack of available low-cost options. She was using off-the-shelf RC cars which would be retro fitted with control boards, servos, and Raspberry Pis to enable this project research.

The solution

By using optical tracking, rather than onboard IMUs, there would be no drift issue - making OptiTrack Prime 17W ideal for the project. Creating a unique experimental testbed consisting of a fleet of 16 miniature Ackermann-steering vehicles with a six-camera system, Target3D worked with the University - sourcing the products, installing the tech and providing specialist hardware training for the lab team.

YouTube link: ▶ Can cars talk to each other?

The experimental test-bed allowed the team to implement state-of-the-art driver models as well as autonomous control strategies, and test their validity in a real, physical multi-lane setup. Through experiments on a miniature highway, Amanda and her team were able to tangibly demonstrate the benefits of cooperative driving on multi-lane road topographies. The setup paves the way for indoor large-fleet experimental research.

"Target3D were instrumental in getting this project done in time."

- Amanda Prorok

For a demo showing how cost effective mocap technology can work for your next project, contact Target3D.

More about how we work with colleges and universities.

TARGET3D