

# An Application to Optimize Lap-times for Race Cars

## Setting:

The use of autonomous vehicles is increasing, and driverless races are starting to take form. This project is aimed at driverless races where a virtual driver could be trained on a virtual racetrack.

## Your Goal:

Create a combined car and track model for the purpose of determining optimal racing lines and speeds for a parameterized vehicle.

## Your Tasks:

- Familiarize yourself with model based design (focus on Simscape, Vehicle Dynamics Blockset, Automated Driving System Toolbox, Mapping toolbox, optimization toolbox and the unreal engine)
- Automatically determine race-circuit geometry from satellite images
- Use circuit geometry to determine optimal racing line for point mass model
- Integrate high fidelity vehicle model into race-simulator
- Use unreal engine to display the resulting optimal lap

## Project Characteristics

Modeling: ★★★★★  
Mathematics: ★★★★★  
Programming: ★★★★★  
Science: ★★★★★



**UNREAL**  
ENGINE