

## Software Lab:

# Application for Electric Vehicle Race Optimization

### Setting:

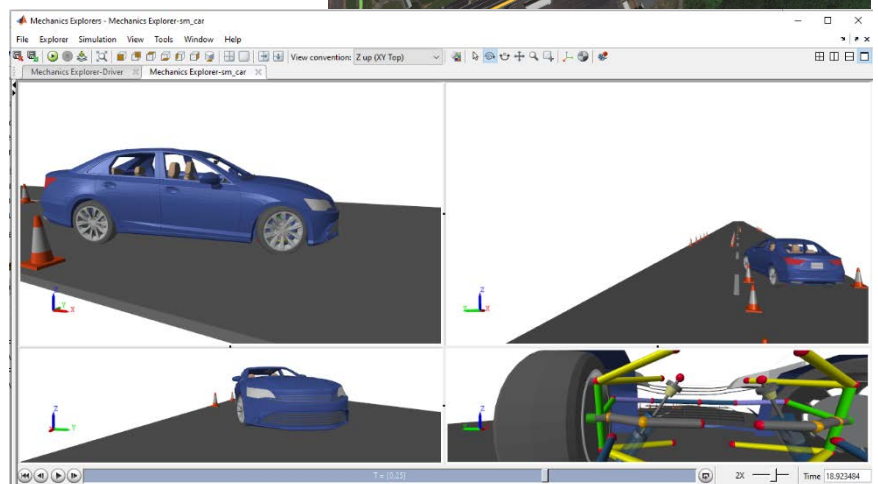
The use of autonomous vehicles is increasing, and driverless races are starting to take form. This project is aimed at driverless races where a virtual driver could be trained on a virtual racetrack.

### Your Goal:

Combine an existing car model with a racetrack model, programmatically determine the optimal path for the vehicle and tune the suspension/tires of the car for the best possible lap-time.

### Your Tasks:

- Familiarize yourself with model based design (focus on Simscape Multibody, Vehicle Dynamics Blockset, Automated Driving System Toolbox, Mapping toolbox, optimization toolbox)
- Use circuit geometry to determine optimal racing line for point mass model
- Integrate existing high fidelity vehicle model into race-simulator
- Tune the suspension hardpoints for better lap times
- Optimize lap for power consumption
- Include support for gaming input devices (Gamepad/Steering wheel)



### Supervisors

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### References

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