

# RACE CAR STRATEGY OPTIMISATION UNDER SIMULATION

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## OBJECTIVE

The purpose of this project is to implement an algorithm for finding the fastest path for a car on a racing track and verifying it through simulations on an open source racing game engine – TORCS.

## MOTIVATION

The traditional methods available for such problems require large amount of computational resources and are impractical for fast pace and real time games, viz- racing games, sports simulators, first person shooters, and real time strategy games.

Thus, the problem demands a more efficient and fast solution, so being enthusiast in computer games the problem deeply interests us.

## APPROACH

- Determination of the racing line in a 2-D track represented through connected polygons.
- Using reinforcement learning to train a controller for the car to follow the determined path.
- Simulate the controller in a realistic environment through TORCS open racing simulator.

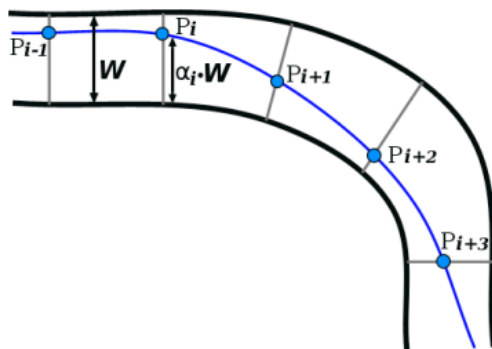


Fig. 1. Representation of a Racing Line.

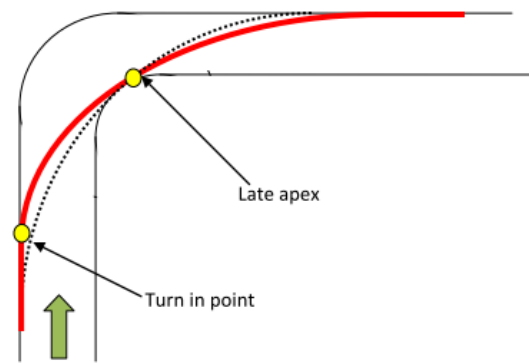


Figure 3.3. A late-apex racing line is shown by the red line. The two yellow round points are the turn in point and the late apex, respectively. To achieve a late apex there should be a late turn in point. The dot line is the center-apex racing line.

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