# COMP5212 Machine Learning 2018 Fall programming project proposal Building a self-driving game bot with Reinforcement Learning

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**Abstract**

In this project proposal, we intend to build a smart self-driving agent using reinforcement learning algorithms. Due to the limitation of real-world hardware and data, we tend to use a game simulator provided by OpenAI to generate training data. We introduce the elements of Q-learning, a reinforcement learning technique which does not require a model of the environment.

## 1 Topic

The objective of this project is to build a game bot that can perform well in a simulated self-driving environment.

## 2 Description of the application and its practical significance

Self-driving car has been a hot topic in recent years. Several industry giants, like Google and Tesla Motor, have devotes significant efforts to developping self-driving cars. Letting computers to drive can not only release human beings from fatigue, but also reduce the frequency of traffic accidents. However, designing a robust self-driving system is non-trivial as the real-world traffic conditions are diversed. Due to the limitation of hardware and computing resources, we intend to find a solution to self-driving in a simulated game environment.

## 3 Formulation of the machine learning problems involved in the application

TODO

## 4 Data set (and preprocessing, if needed)

TODO

## 5 Machine learning methods

TODO

## 6 Design of experiments and performance evaluation

TODO