Master Thesis
Safe Reinforcement Learning For Automated Vehicles

Reinforcement learning (RL) opens the possibility to learn optimal action strategies by interacting with the environment. While impressive results in extremely complex tasks, like playing the game of Go [1] or computer games [2] can be achieved, applying RL in safety-critical applications e.g. automated driving is still a challenging task. A major reason for this is that generally no guarantees can be given for learned approaches like RL.

The goal of this work is to combine RL techniques with classical approaches to generate safe, human-like driving strategies for automated vehicles.

The proposed thesis consists of the following parts:

+ Literature research about reinforcement learning and safety in the context of automated driving.
+ Implement a motion planner for automated driving using reinforcement learning.
+ Develop methods to verify safety for the learned motion of the vehicle.
+ Evaluate the implemented methods


I am happy to answer questions you might have. Feel free to ask for an appointment or directly ask at my office!

For more information please contact:

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Or directly send in your application including your current grades as well as our questionnaire!

1 skill levels:
beginner < 500 lines of code (LOC)
advanced 500 – 5000 LOC
proficient > 5000 LOC