

**Exercise 1.** (*Simple MATLAB MPC implementation*)

Have a look at the `ModelPredictiveControl` class provided in the [GitHub repository](#) for the lab exercises. Understand the model predictive control (MPC) implementation with the help of the explanations in `+cmmn/ModelPredictiveControl_background.pdf`. Feel free to experiment, e.g., implement a speed controller using the sample code as a basis.

**Exercise 2.** (*Advanced MPC*)

Have a look at [the code of Bassam's PhD thesis](#).

- a) Classify the vehicle model.
- b) What variants of MPC controllers are used to avoid collisions?

**Exercise 3.** (*Sequential convex programming*)

Have a look at [the code of Bassam's PhD thesis](#). Understand how sequential convex programming is applied to the optimization problem. You might want to start with the file `controller/SCP_optimizer.m`.