Tips:

1. Ipopt works better when objective and constraints are twice differentiable. So when there’s absolute value function in obj or constraint, use epigraph variable to remove absolute value functions.

Sensor model:

Correct reading:

Missing reading:

out-of-FOV reading:

fake reading:

Remaining issues:

1. Conversion of different coordinates (camera, robot, global) is needed, e.g. fovModel is affected.

Files:

1. testController.jl is similar to the code in controller.jl but without connecting with ROS
2. map\_julia.jl is a previous version for running with ROS
3. controller.jl contain codes for connecting with ROS

Termination check

CarMpcUtils

CarMpc

Solve MPC

Update map

Controller.jl