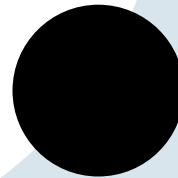


Automotive Control Systems

Final Exercise (as fulfillment of the exam)



Consider the Truck/Trailer System of lecture 6.

For this system create a stabilizing feedback control using the flatness approach.

Matlab functions to calculate the Lie derivatives and fourth order derivative of the reference coordinate subject to the arc length are provided. Also a function, that calculates the derivatives of the path polynomial given the initial or final truck/trailer configuration. It is recommended to use a 7th order polynomial for the path.

It is also recommended to first use the open loop variant for testing.

The results have to be properly documented in a selfcontaining and scientifically well written report. The grading is based on validation of robustness, quality of code, visualisation and documentation.

***** Add on

The control law used so far is working for forward motion. In case of backward motion ($dx/dt < 0$) the eigenvalues of the linear controller have to be chosen to be positive. (The rest can remain unchanged 😊) Try to create a simulation with a backward moving truck/ trailer.