

Master Thesis Proposal

Analyzing Fault Tolerant Control Strategies Using Optimal Control Methods

Reliability of industrial systems, such as autonomous vehicles, is important to avoid damages due to faults. Faults or component failures can result in unexpected system behavior which is a safety hazard. Therefore, some active counter-measures are necessary when a fault is detected and identified to maintain system stability and reliability. Some systems cannot be stopped immediately when a fault is detected, however, by performing automatic reconfiguration of the system or change its operating behavior, for example “limp-home mode” in vehicles, the impact of the fault can be minimized. This is referred to as Fault Tolerant Control.

In this thesis work, fault tolerant control is investigated as an optimal control problem and formulated using tools like CasADi. The objective is to model and analyze an autonomous vehicle scenario where fault mitigation control strategies is performed where the effects of a detected fault are minimized on system operation.

We are looking for students who are interested in learning more about formulating optimal control problems and fault tolerant control and work with problems that are relevant for developing reliable autonomous vehicles.

If you are interested or have questions, please feel free to mail me:

daniel.jung@liu.se

or come by my office in the vehicular systems corridor (B-building behind Café Java).