

Sensor fusion for vehicle sideslip angle estimation

Project Summary

The goal of this project is to design a nonlinear Kalman Filter (KF) to estimate the sideslip angle of a vehicle. The KF fuses the data of multiple sensors together, which deliver indirect and noisy measurements. The goal is to obtain the best estimate for the sideslip angle, and to evaluate the designed solution in simulation and using a real system in the laboratory.

Project Type

- BA Thesis (3-6 months)
- MA Thesis (6 months)
- Praktikum (3 months)

Required Qualifications

- Interest in mechanics / vehicle dynamics
- Basic courses in mechanics and control
- Familiarity with Kalman Filter

Contact

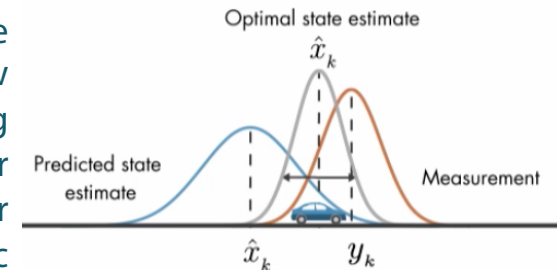
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Detailed Description

The estimation of the sideslip angle of a vehicle while driving is an important problem in the design of chassis control systems and autonomous driving. Many approaches exist in the literature and in the form of patents.

In this project, we will take a new approach using an Extended KF or Unscented KF for a kinematic bicycle model.

The goal is to explore different design options and find the best design possible. The design is to be validated in simulation and using a real system in the laboratory.



References

- D. Chindamo, B. Lenzo and M. Gadola, "On the vehicle sideslip angle estimation: A literature review of methods, models, and innovations," Applied Sciences, 2018.