

# Project proposal

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Title: Kalman Filter for Rover localisation  
Supervisor: Prof. Ferrari Trecate Giancarlo  
Timeframe: Spring 2021

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EPFL Xplore is an interdisciplinary project whose aim is to design and develop a Rover to participate in two international competitions: the University Rover Challenge and the European Rover Challenge. The Rover needs to navigate autonomously from different using software developed by students.

## Project description

### Problematic

We need to know the position of the Rover at all times. We are currently using a Kalman filter from ROS directly, but we are looking for a personalized Kalman for our Rover.

- 1) familiarizing with the nonlinear state-space model of the rover and sensors
- 2) simulation on the model of the rover
- 3) development of EKF (extended Kalman filter) - tuning of the covariances
- 4) validation of EKF through simulations and analysis of residuals
- 5) implementation of alternatives for comparison

It is also asked to develop a plugin for ROS in order to interface the Kalman with the Rover.

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