

Project proposal

Title: Deep Learning approach for localization
Supervisor: ...
Timeframe: Spring 2022

EPFL Xplore is an interdisciplinary project whose aim is to design and develop a Rover to participate in international competitions, namely The University Rover Challenge and the European Rover Challenge. During those competitions, the rover has to navigate autonomously through mars-like terrain using its on-board sensors.

Project description

For the rover to be autonomous it needs to compute a precise estimation of its pose. The rover uses multiple sensors that are sensitive to noise and subject to non-linearities. Combining the sensor's data with sensor fusion enables a more precise estimation of the rovers global pose.

In this perspective, the student will develop a localization algorithm through a Deep Learning approach, with the goal to outperform an EKF (Extended Kalman Filter). The inputs consist of the sensors mounted on the rover and the outputs consist of the rovers pose and velocity. The code must be compatible with ROS Melodic to allow an easy integration into the project. The student will be part of the Xplore Navigation subsystem and attend its weekly meetings, such that a close collaboration with the other team members is possible.

Requirements

- Deep Learning
- Kalman Filter
- Basic Knowledge of ROS 1

Contact

bastien.darbellay@epfl.ch