Project proposal

Title: Deep learning approach to Stereo Cam Odometry
Supervisor: George ADAIMI (VITA)
Timeframe: Spring 2021

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.

Project description

Problematic

Knowing the accurate position (not using GPS) of the rover is one of the most important and challenging aspect of Xplore Navigation Subsystem. This step is crucial for our path planner , the mapping of the environment and our motor controller.
So far we use a IMU and encoder, but those solutions cannot detect slip and output wrong positions estimations. To solve this we have a semester project on 3D Lidar odometry.
Unfortunately 3D LiDar are extremely expensive and it is a known fact that stereo cameras can with some degree replace LiDars (less precise and more prone to perturbations). The goal of this project is to use the stream of stereo cameras image pair to estimate the position of the rover.
In this project you will design a model to estimate the position of the rover given a sequence of 360 stereo image pairs.
We will give you a dataset with the stereo cameras stream and the position of each frame.

Requirements

Interest in Machine Learning and/or the Odometry challenge

Reference documents

[1] VINET : https://arxiv.org/abs/1701.08376

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