Project proposal

Title: Rover Surround view using Novel View Synthesis
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 3 of the 4 missions that they have to achieve, our rovers need to navigate through sandy/rocky terrain to reach their destination.

Project description

An essential part of the tasks to accomplish in the European Rover Challenge (ERC) and the University Rover Challenge (URC) is the navigation through sloppy terrains made of sand, rocks and obstacles to simulate a mars terrain. Whether the rover is in autonomous mode (i.e. navigating autonomously through the mars yard) or in manual mode (i.e. manually controlled by an operator at the control station) it is useful to visualize the surroundings of the rover to enhance its operability in rough terrains.
In this perspective, the project's aim is to develop a surround view system for the rover by making use of the cameras that are placed on the rover. It consists of an instance of the Novel View Synthesis problem in machine learning and computer graphics. The student will be part of the Xplore Navigation subsystem and work closely with the control station subsystem to generate the surround view and have it displayed on the Control Station of the rover.

Requirements

- Machine Learning: Non-Linear Reduction, Autoencoders
- Basic Knowledge of ROS 1

Contact

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