

PhD Proposal MAP-I

Collaborative Generation of 3D Perceptions Maps

Supervisors and Research Units

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Abstract

State of the art tools are needed in order to retrieve a coherent global world state perception in dynamic or partially known environments. The need for quick information retrieval pushes for the use of collaborative mapping associated with the need for a coherent 3D world state that must be obtained by information fusion.

State of the art sensors for remote perception include Stereo Vision, radars, lidars and 3D Cameras, that is, cameras where each pixel includes distance information. 3D cameras are particularly interesting for mapping scenarios because they offer large amount significant information at a large data rate and with low latency, adequate for real time performance. Cooperation between heterogeneous robots is interesting in order to quickly achieve high quality perception for later decision making process. Heterogeneous robots would find several types of information to be merged together from different types of on-board sensor devices. Obtaining high quality information is likely to require active mapping techniques.

The idea of having land and airborne sensory information seems interesting in many scenarios such as asset tracking, rescue and dynamic mapping.

Objectives

The main objective of the project is to innovate in 3D perception and mapping by using heterogeneous robots.

The goals of the project include finding a model for the heterogeneous robots that will be used; modeling the sensors to be used; solving the data merging problem by producing innovative structures for perception and building a simulation to validate previous work.

Additional Information

Complete description available upon request.