

Master Thesis

Lakeside Labs

Jakub Misiorny: Feature extraction and matching in multi-spectral images

Description

This thesis is a part of the cDrones research project conducted in Lakeside Labs.

First part of the of the research will explore the properties of the infrared cameras, which includes (i) IR lens distortion calibration - this will require building a custom made IR-emitting checkerboard pattern, (ii) developing hardware platform for mounting expensive IR cameras on the drones, (iii) researching how the cameras respond to different subjects and environments, (iiii) understanding how objects that we see in visible light look like in IR part of the spectrum.

Second part of the thesis research will explore how we can use that knowledge in using the IR + RGB imaging. The goal of this part is to be able to stitch IR images together in real time and to overlay them on corresponding RGB images mosaics. This will require the development of algorithms specifically tailored to IR (and IR - RGB correspondence) images, based on properties found in the first phase. Multi-spectral mosaics of a disaster zone will help rescue services to identify regions of interest like trapped people, ignition sources or explosive materials. Furthermore IR imaging proves effective in condition where traditional cameras don't work at all like fog, smoke, mist and most importantly at night.

Advisor

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