

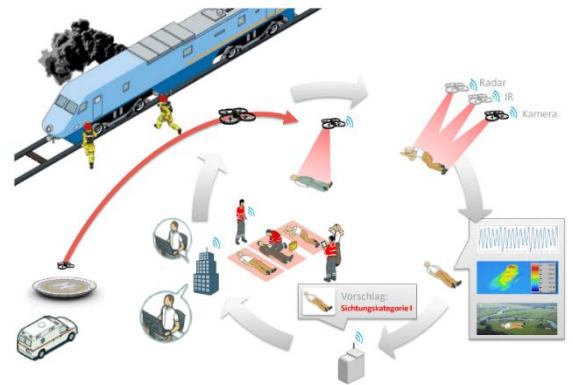


Bleeding detection on injured patients using thermal and visible imaging in disaster medicine

Introduction

In a mass casualty incident (MCI), such as a railway accident or far-reaching natural disaster, way more medical resources are often required than the ones immediately available on site. Before patients can be treated and transported away, they are divided into categories according to the severity of their injuries (triage). Due to a lack of routine, this may impose high stress and emotional strain for the emergency services.

In the FALKE project, a flight system equipped with visible and thermal imaging technology is used for a partially automated search and triage of injured people in the disaster area.



Aim of the work

Within the scope of the FALKE project, a software system is to be developed which, based on algorithms and models for body detection and segmentation, enables the differentiation of potential injured patients from light and moderated ones. For this purpose, one of the factors for this differentiation is the detection of bleeding on the surface of the skin through thermal differences and dark color spots on clothes using RGB imaging. Thus, in this work, an algorithm will be developed for bleeding detection on different regions of the patients with the use of infrared and visible cameras. The degree of bleeding may be accessed using diverse image techniques as well.

Requirements

- Experience in digital image processing
- Programming experience (python is desirable)

It is still advantageous:

- Experience with common Python libraries (OpenCV, Pytorch/Keras/Sckit Learn)
- Basic knowledge of (multi-)camera systems (calibration, projection matrices)
- Informatics/Electronics/Physics or similar – related field studies

What we offer

In the course of the work, skills can be acquired using state-of-the-art digital image processing methods in conjunction with the latest drone and camera technology. The offered project is very application-oriented, and the developed algorithms can already contribute to saving lives in the near future. Furthermore, the Medical Technology Section with its composition of physicians, engineers and natural scientists offers a professionally diverse working environment.

This is potentially a bachelor thesis.