Master thesis

Am Lehrstuhl für Betriebswirtschaftslehre ist in der Arbeitsgruppe Projekt- und Ressourcenmanagement in der bebauten Umwelt eine Abschlussarbeit zu folgendem Thema zu vergeben:

Sensor-based drone-mounted (UAV) energy leakage detection and retrofit management for urban quarters

Background
The building stock is very material and energy intensive. As a space for living, use and production it massively influences the achievement of energy efficiency and energy transition as well as municipal, national and international climate protection and sustainability goals. The digitalization, the detection of energy leakages and the reduction of energy losses on the scale of urban quarters are a great chance to increase energy efficiency, to invest and reduce energy cost and to meet climate goals.

Contents of the work
It is the aim of this thesis to process sensor-based and drone-mounted data acquisition of campus and urban quarters. The data (RGB and infrared images) is available from previous drone flights.

In the thesis, a method for data processing and analysis has to be developed and implemented. The data has to be processed, mapped and geo-referenced for further use as well as analysed with respect to energy (heat losses) in buildings and infrastructure. The following research questions have to be answered:
- What are retrofit possibilities?
- Can objects be identified that are in need of energy retrofitting with positive net present values?

You will learn how to generate a georeferenced mapping of the data, an identification and evaluation of retrofit options and to develop retrofit strategies based on (cluster) analysis or prioritization methods. The resulting research and development needs should be clearly outlined. The elaboration as well as own results and conclusions are to be presented comprehensively within the scope of the work.

Conditions
The offer aims primarily at students of industrial engineering and informatics but also at students of other disciplines. As this work is done in cooperation with the University of Southern California (USC), Los Angeles, the thesis' language has to be English.

Beginning / Duration
Straightaway / 3-6 Months

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