AUFGABE DER BACHELORARBEIT

im EIT/ISE-Studiengang

für: **Student*in**

gestellt von: **Prof. Dr.-Ing. Andreas Czylwik**

Thema: Development of a hand-held device for relative positioning on a surface.

A measuring system is to be developed that enables the manual scanning of surfaces by moving a hand-held device over a surface, whereby the relative position of the measuring head is recorded with optical sensors. The position detection is to be realized with two optical sensors that work independently of each other. By combining the sensor outputs, the inclination of the measuring head is to be detected.

The positioning system will be integrated into a THz spectroscopy system in order to link measured values with position data. This measuring system will be used to record depth information and assess the condition of various surfaces. The depth information is intended to enable the localization of damages below the surface, which are not visible to optical measurement setups. The detection of potentially dangerous objects, such as electrical or water pipes in residential buildings, could also be an application of such a system.

This thesis focuses on the development of the system for determining the position and orientation of the measuring head.

The task entails the following steps:

- creating a time and work plan,
- getting familiar with the fundamentals of position detection,
- development of a suitable concept for the position detection system,
- development of a control script for the system,
- characterization of the position data,
- final presentation of the work, and
- submitting a digital copy of documentation and presentation in PDF format.

Zweitgutachter: Prof. Dr.-Ing. J. C. Balzer

Duisburg, _____ Betreuer: _____

Prof. Dr.-Ing. A. Czylwik