Department of Informatics
Institute for Anthropomatics und Robotics (IAR)
Chair for Intelligent Sensor-Actuator-Systems (ISAS)
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Intelligent ISAS
**Sensor-Actuator-Systems**

Modular framework for 3D Surface reconstruction

Student Assistant

As part of an IGF project on particle measurement technology, research is being conducted on the dynamic image analysis of small particles, such as bricks and slag. The aim is to capture desired 3D information, such as particle sizes and shape characteristics, through multi-view recordings. To achieve this, popular methods of neural surface reconstruction (NSR) are used. These methods improve the 3D understanding of objects within a deep learning framework by reconstructing detailed 3D surfaces using image-based neural rendering techniques.
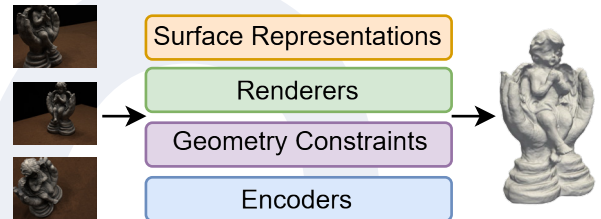
Several public codebases for NSR have gained importance in research. However, due to a lack of consolidation, numerous NSR repositories exist, each focusing on improving specific components of certain algorithms. These repositories often address different challenges, leading to parallel but incompatible implementations.

To efficiently capture the diverse and rapidly growing field of NSR research and to integrate ideas from various research projects, the following exemplary tasks are proposed for the offered position:

- Literature research on NSR,
- Classification and comparison of existing NSR methods,
- Consolidation of key techniques into modular and reusable components,
- Development of a user-friendly plug-and-play workflow,
- Support for geometry export formats, such as point clouds and meshes.

Requirements:
Students with a background in computer science, mathematics, electrical engineering, or other engineering majors. Pre-knowledge in image processing as well as computer graphics is welcome. Strong self-motivation, reliability, and critical mind are expected.

Emphasis:

Theoretical Study	████████████
Software Implementation	████████████
Hardware Implementation	███

We offer:
- excellent support and advice
- highend infrastructure
- contact to research partners
- publication opportunity

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