

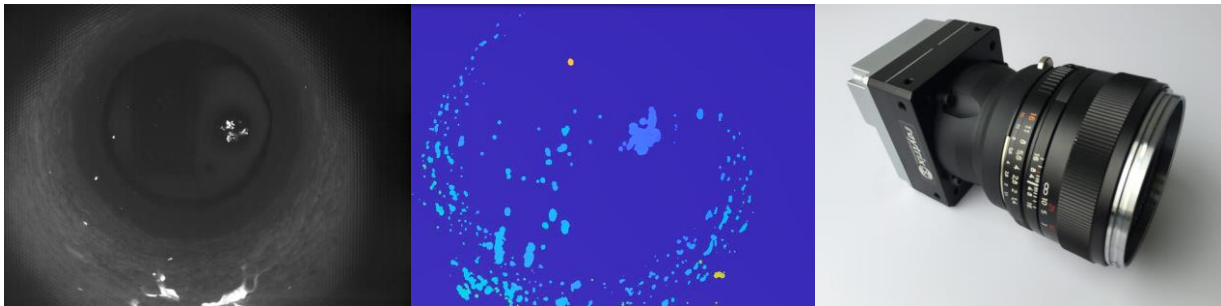


HIWI

Validation of the spatial trajectories calculated from the images of a plenoptic camera

The invention of plenoptic (light field) cameras allows to measure the 3D information with a single camera. Since this technology has been developed in the recent years, the data processing techniques still remains to be optimized. In our current project, a plenoptic high-speed camera is used to measure 3D particle trajectories in combustion processes. The goal of the project is the theoretical and experimental analysis of the 3D particle locations and the 3D 3C particle velocimetry with the help of the image from the plenoptic camera.

The lateral motions of the particles will be recorded in the same way as with normal cameras and the depth information will be delivered in the unit of virtual depth. In order to switch the coordinates into metric coordinates a metric calibration is necessary. The camera software already contains algorithms for the metric calibration.



Tasks:

- Literature review focusing on the application of plenoptic cameras for 3D measurement.
- Planning and implementation of laboratory experiments for the validation of the metric calibration
- Validation based on the experimental results with MATLAB
- First investigations of 3D tracking algorithms based on experimental data

Requirements:

- We are looking for a highly self-motivated student in the field of mechanical engineering or related. Knowledge and experiences in MATLAB is a requirement.