

The Department of Microsystems Engineering (IMTEK) is a renowned academic research center in the field of sensing technology. The Laboratory for MEMS Applications (Prof. Dr.-Ing. Zengerle) develops research tools for diagnostics, microfluidics, etc. For a project in collaboration with a leading European sensor company, we are looking for a

## Thesis/ HiWi student for 3-6 months (m/f/d)

### Characterization and data processing in developing a novel ultrasound sensing scheme for tubular fluid flow & composition detection



*Courtesy of Bronkhorst B.V.*

The goal of this project is to carry out characterization experiments and data processing programs for developing a new fluidic sensing scheme by using ultrasound guided waves. The novel setup uses piezoelectric transducers for both transmission and detection, and there are multiple possibilities in terms of physical arrangements and transduction algorithms, so that the goal of accurately measuring liquid flow rate and composition data can be achieved.

#### Your tasks:

- Lab experiments for readout from an ultrasound sensor array
- Acoustic data processing & Summarizing of patterns
- Numeric computation to explore new sensing possibilities, for flow/ composition detection
- Additional possible task of complex field software simulation (Fluid-Acoustic)

#### Your profile:

- You are a 2<sup>nd</sup> or 3<sup>rd</sup> year MSc/Bsc student in a Physics/Engineering/Computational area
- You have hands-on mindset for lab experiments and programming
- Solid background in electronics and instrumentations; Interest in sensing principles
- Solid communication skills in English and/or German language
- Able to work in an independent and organized manner
- **Experience/ knowledge in at least one of the following areas crucial for candidacy:**
  - (Acoustic) signal processing, data analysis or pattern recognition algorithms
  - Numeric analysis with PDE (preferably in acoustic guided waves/ fluidics/ vibration)
  - Excellent at Matlab/ Python programming, Comsol or acoustic simulation tools a plus
  - And/ Or you are a very quick learner and self-dependent.

#### We offer:

- Working as a master/bachelor thesis or as a HiWi position
- Attractive workplace in a modern, excellently equipped laboratories
- Rather fluid working hours; Specific project topics can be adjusted to personal interests

The earliest possible start will be in December 2020. If you are interested, please contact us:

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