Sony is one of the most innovative companies in the world and drives the development of technology in a global network of research institutions. The Stuttgart Technology Center (STC) was founded in 1989. As part of the Sony Semiconductor Solutions Europe Group the Stuttgart Laboratory 1 (SL1) and the Stuttgart Laboratory 2 (SL2), are home to two research and development groups. Furthermore, the Automotive Semiconductor Sales & Marketing (ASSM group), the Technology Partnerships Europe (TPE) and Intellectual Property Europe (IPE) departments are part of STC.

Stuttgart Laboratory 1 conducts research in the areas of "Computational Imaging, Perception Systems, RF Communications, Artificial Intelligence and Speech & Sound Processing."

To strengthen our team in SL1 we are currently looking for an

**UWB Positioning Setup and Measurements (m/f/d)**

This is a part-time working student position at the Sony Technology Center in Stuttgart, Germany.

**Background**

Ultra-wide band (UWB) has recently seen an increase in popularity, due to its beneficial use in ranging and localization applications, e.g., digital car key. Due to the high bandwidth of UWB signals, an excellent time resolution can be achieved. By making use of time-based ranging protocols, UWB can achieve very accurate range and position estimates. The fundamental concept of time-based ranging schemes is to determine the timestamp of the first arriving path of a ranging link. This so-called line-of-sight (LOS) path defines the distance between two ranging participants. Typically, a ranging link consists of an anchor (fixed infrastructure) and a tag (mobile device, which shall be located).

**Problem**

In typical indoor environments, dense multipath scenarios are common, making it challenging to determine the first arriving path, which determines the range information. The positioning performance may vary significantly for different environments and scenarios (e.g. LOS, obstructed LOS, NLOS). Furthermore, the number, placement and orientation of anchors and the types of antennas used at anchor and tag will have a fundamental impact on the achievable positioning quality. Due to this large degree of freedom, it is important to measure and evaluate many different positioning setups and scenarios to benchmark the performance, identify issues and optimize the system.

**Your tasks:**

- Study of UWB ranging and positioning systems in general and specifically, the used setup.
- Setup positioning system in different environments and/or anchor constellations.
- Ranging and positioning measurements to obtain data set for evaluation.
- Benchmark and evaluation of data sets.
- Documentation of the work in a suitable form (e.g., internship report or similar).

**Requirements:**

- Experience with MATLAB
- Knowledge in signal processing, sensing and/or communications

**We offer:**

- The opportunity to work in an international team with diverse expertise ranging from acoustics, analogue hardware to digital signal processing, machine learning and informatics
- The chance to apply your skills and theoretical knowledge in cutting-edge research activities
- Learning more about state-of-the-art technology in your field of interest
- An open and international environment with engineers and students from many different countries
• **Working Student:** A compensation of 15 € per hour (gross) and lunch subsidiary

**Application:**

• Documents: curriculum vitae, grades, application letter, and (if available) testimonials of your previous tasks
• Applications without complete CV and list of grades cannot be considered
• Please refrain from applying, if you have already graduated or you will be by an expected start date

Become part of the Sony family—hence a part of the future! We are looking forward to answering your questions and to getting into contact with you. Please send your CV, application and grades to ephraim.fuchs@inue.uni-stuttgart.de.