

TWO DOCTORAL POSITIONS AT THE IKG

At the ikg two doctoral positions are to be filled in two research training groups. A doctorate in a Research Training Group is characterized by the fact that a structured, intensive supervision and qualification is to be achieved so that a degree can be obtained within 3 years.

In each case, the positions are 100% positions, which are remunerated according to TVL E13.

Both topics deal with highly topical and relevant research questions in the context of **mobility** and **autonomous driving**, for which modern methods of data processing, including **machine learning/deep learning**, are required.

1 DOCTORAL POSITION IN THE RESEARCH TRAINING GROUP SOCIALCARS

In the SocialCars Research Training Group, 12 doctoral students are working on questions of how the traffic of the future can be organized in such a way that individual mobility goals and requirements are harmonized with social goals - such as environmental and urban compatibility. The topics at the ikg deal with the analysis and automatic interpretation of spatial data, e.g. the prediction of movement trajectories using Deep Learning or the communication of route information using Augmented Reality. The following topic is to be worked on in the context of the advertised position; if necessary, it can be adapted to the interest of the candidates.

TOPIC: COLLECTIVE PERCEPTION - CONSISTENT INFORMATION FUSION AND VISUALISATION

Sensors that will be available in vehicles in the future will make (local) environmental information of individual road users available. By integrating this sensor data, a collective perception can be created that goes beyond the horizon of individual users. However, the fusion of the data requires that inaccuracies and uncertainties in the respective individual data be taken into account. In this PhD-project, fusion methods will be developed (e.g. based on Deep Learning) with the aim of a consistent representation of this aggregated environment. In addition to the appropriate propagation of the uncertainty, methods of visualization are to be developed, which communicate these uncertainties adequately and thus make transparent to the user where he has to expect which data quality.

Prerequisite for working on the project is a profound knowledge of geoinformatics and cartography or visualization. Furthermore, programming knowledge is required.

2 DOCTORAL POSITION IN THE RESEARCH TRAINING GROUP I.C.SENS

The research training group i.c.sens (Integrity and Collaboration in Dynamic Sensor Networks) is concerned with how autonomous systems can be integrated into the human environment in such a way that they do not pose a danger for people. This requires that these systems know at all times how reliable their states are. In the context of this joint project with 9 other PhD students, the ikg is working on questions concerning the acquisition and visualization of sensor data. The following topic is to be worked on in the context of the advertised position; if necessary, it can be adapted according to the interest of the candidates.

TOPIC: INTEGRITY MEASURES FOR THE HIERARCHICAL AND INCREMENTAL COLLECTION OF MAP DATA

The data collected jointly by several road users are characterised by varying degrees of detail, accuracy and completeness. The integration and fusion of this information into a consistent dynamic map requires the integration and propagation of quality and integrity measures at the different display levels. The project includes the definition of multi-scale representations of quality measures and mechanisms for propagating these measures across the different representations, in particular across different scales. Methods of cartographic generalization, machine learning/deep learning and optimization are required for this purpose.

If you are curious about the positions, please do not hesitate to contact Prof. Monika Sester, monika.sester@ikg.uni-hannover.de or staff members of the ikg.