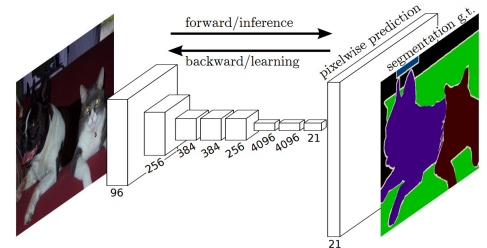




"Efficient Invariant Deep Models for Computer Vision" PhD Position at the MPI for Intelligent Systems, Tübingen and the Robert Bosch GmbH, Leonberg

The Perceiving Systems department at the **Max Planck Institute for Intelligent Systems** in Tübingen and the **Robert Bosch GmbH** in Leonberg are looking for a highly motivated PhD student interested in **computer vision** and **deep learning**. The duration of the fully funded PhD is 3 years and the student will work 50% of the time at the MPI for Intelligent Systems, Tübingen and 50% of the time at the Robert Bosch GmbH, Leonberg. Thus, this position provides an excellent link between academia and industry. The student will be supervised by a researcher from MPI Tübingen and a researcher at Robert Bosch GmbH and therefore benefit from both environments. The conducted research is expected to have a high impact on science as well as in industry.

About the project: Machine learning has transformed computer vision over the last years. With the advent of large annotated datasets and increasing computational resources, feature learning with deep neural networks has become the dominating technique for solving a variety of computer vision tasks. The goal of this project is to investigate physical invariances in deep convolutional neural networks for computer vision and to develop models which can generalize to novel domains such as new sensor arrangements. Towards this goal, a generative forward model of the image formation process using physically-based rendering techniques shall be developed and applied to several different tasks (e.g., scene understanding, semantic segmentation, object detection) in the context of multiple practically relevant applications (e.g., autonomous driving, advanced driver assistant systems). Furthermore, model selection aspects and efficiency of inference shall be considered. As neural networks are both computationally and memory intensive, novel techniques need to be developed which allow to compress neural networks by learning only relevant connections or leveraging suitable coding techniques.



Applicants should hold a Master's degree in computer science, mathematics, physics, or engineering. Successful candidates will typically have ranked at or near the top of their classes and be highly proficient in written and spoken English. Very good computer science skills as well as a solid mathematical background are required. Prior research experience in computer vision / machine learning is a plus.

Max Planck Institutes are internationally renowned and regarded as the foremost organization for fundamental research in Germany. The MPI for Intelligent System studies perception, action and learning. The Perceiving Systems department is located in Tübingen together with the Empirical Inference department, the robotics research department and the renowned MPI for Biological Cybernetics. The Max Planck Institutes in Tübingen represent an exceptional research environment in which scientists from a wide range of fields including computer vision, machine learning, robotics, neuroscience, and cognitive science collaborate, giving students access to unique research facilities, a rich intellectual environment, outstanding infrastructure, and great research freedom. The language of the department is English and the culture is international. More information about the department and our research can be found at <http://ps.is.tuebingen.mpg.de/>.



Bosch is a leading global supplier of technology and services, covering a broad spectrum of applications including driver assistance and autonomous driving. Driver assistance systems based on various sensing modalities like video, radar or ultrasound are developed within the Chassis Systems Control division in Leonberg. Bringing such cutting edge technology on the market requires an advanced and strongly interdisciplinary algorithmic approach covering fields like signal processing, computer vision, machine learning and robotics. We deal with challenging but also rewarding applications in the automotive domain with the goal of improving the safety, comfort and fun of driving, thus creating technology for life.

Please send your application materials (see <http://www.cvlibs.net/applications.php>) including a cover letter, research statement, transcripts, CV and names of at least two references to andreas.geiger@tue.mpg.de. Your research statement is critical and should address how your interests relate to this project and why you want to do a PhD with us.