



Deep Learning for Computational Photography

PhD Internship at the MPI for Intelligent Systems, Tübingen

The Perceiving Systems department at the **Max Planck Institute for Intelligent Systems** in Tübingen is looking for a highly motivated **visiting PhD student** interested in **computer vision** and **machine learning**. The visit is supported by a scholarship of MPI for a duration of 6 months. The applicant must hold a Master's degree and should currently be enrolled in a PhD program at a university or research institution. The student will work on state-of-the-art research at the intersection of computer vision, computational photography and machine learning, closely supervised by a researcher from MPI Tübingen. The conducted research is expected to highly impact both science as well as industry in the short and long term.



About the project: In the past decade, deep learning has revolutionized computer vision and machine learning. While the success of deep learning techniques has been demonstrated for many core computer vision tasks (e.g., object recognition, semantic segmentation, correspondence estimation and many more), their use for enhancing the quality of digital images or rendering artistic effects has received less attention so far.

The goal of this project is to make deep neural networks applicable to very large imagery (10-50 Megapixels) while still allowing for efficient learning and inference. Furthermore, novel models shall be developed which are able to enhance images by learning the physics of the underlying image formation process and camera optics. In particular, this will allow for rendering effects such as image relighting, deblurring, defocusing, aberration correction, synthetic flashlight or HDR. Suitable loss functions need to be developed and the approach will be evaluated on a novel dataset.

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

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 together with the Empirical Inference department, the robotics research department and the renowned MPI for Biological Cybernetics. MPI Tübingen represents an exceptional research environment in which scientists from a wide range of fields 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. For more information, please see: <http://ps.is.tuebingen.mpg.de/>.



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