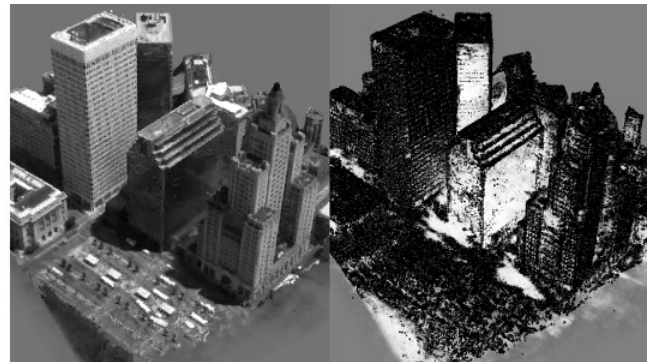
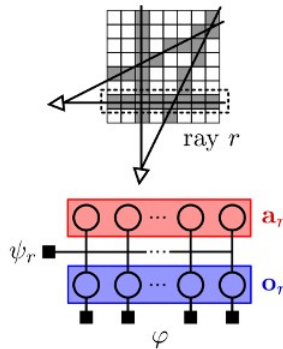




Accurate Reconstruction of Lights, Materials and 3D Geometry from RGB, Depth and Motion

PhD Position 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 PhD student interested in **computer vision** and **machine learning**. The three year PhD scholarship is sponsored by **Microsoft Research Cambridge** (UK) and the PhD student will be based at the Max Planck Institute for Intelligent Systems in Tübingen with regular visits at Microsoft Research Cambridge. The PhD student will work on state-of-the-art research in computer vision and machine learning, being co-supervised by a researcher from MPI Tübingen and Microsoft Research Cambridge. The conducted research is expected to highly impact both science and industry in the short and long term.



About the project: In the past decade computer vision technology and novel depth sensing devices have enabled a new quality of natural interaction with computing devices. A key factor enabling this progress has been a more accurate understanding of the user and his environment through RGB+depth cameras, allowing accurate position tracking and approximate recovery of the scene geometry in real-time. However, current systems are limited in that the recovered scene representation is coarse and approximate, for example, material properties and light sources are not recovered. The goal of this project is to develop efficient probabilistic models of light, materials, and geometry in order to provide high-fidelity reconstructions of the user environment from RGB and RGB-D video: Given several images as observations, the task of inverting the image formation process is to recover the 3D geometry of the scene, recognizing the objects and materials they are composed of, identify light sources present in the scene and reason about light transport including reflection, refraction and shadows. As inverse graphics is an ill-posed inference problem, appropriate prior assumptions about the world must be made.

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 are 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. For more information, please see: <http://ps.is.tuebingen.mpg.de/>.



Your application: Please send your full application materials (see <http://www.cvlibs.net/applications.php>) including a cover letter, research statement, transcripts, CV as well as contact details 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.