

Ph.D. position in Computer Graphics within the EU ITN project “DISTRO”

Full time appointment for 36 months
Start date January 2016



We are seeking a highly motivated and creative student to work on the EU-funded project “Distributed 3D Object Design” (DISTRO). A candidate should hold a Master’s degree in Computer Science, Mathematics, or Physics and have a solid background in computer graphics. Excellent programming skills in C++ and fluent communication skills in English are essential.

About MPI Informatik. The Max Planck Institute for Informatics (MPI) in Saarbrücken is a part of the Max Planck Society, Germany’s leading research organization. The institute runs an active fellowship program on both the PhD and postdoc levels. The Computer Graphics Group at MPI currently consists of about 40 researchers (including 8 senior-level researchers), and in the last decade over 20 former group members received offers for tenured faculty positions.

About the Project. DISTRO is an Innovative Training Network (ITN) focused on the distributed capture, editing, and fabrication of objects - from the real world to digital and back again. The project goal is to enable users to casually capture objects, which can then be easily shared on the Web, customised in simple ways, and physically replicated elsewhere. The research topics tackled within the project include geometry and material capture, collaborative editing, rendering and physical fabrication.

This exciting collaborative project is coordinated by [University College London](#) (UK), and the academic partners include some of the most renowned research institutions in Europe: [ETH Zurich](#) (CH), [DFKI](#) (DE), [Charles University in Prague](#) (CZ), [Saarland University](#) (DE), [IST Austria](#) (AT), [Napier University](#) (UK) as well as [MPI Informatik](#) (DE).

There are also numerous industry partners involved in the project: [Studio Gobo Ltd](#) (UK), [NVIDIA Research](#) (US/FI), [Disney Research](#) (US/CH/UK), [The Foundry](#) (UK), [Allegorithmic](#) (FR), and [Evolute](#) (AT).

Each of the project partners contributes world-class competence in a particular area, and the core research contribution of MPI Informatik is in the area of Computer Graphics. In particular, our Ph.D. position will focus on realistic image display and high quality fabrication.

Description of the Offered Position. MPI Informatik offers a fully paid Ph.D. position for one student, (36 months, paid by the EU), with the possibility to later extend the time in Saarbrücken by one more year (paid by national funding). Apart from the research work itself, the students’ participation in the project will involve tight collaboration with project partners and frequent visits to the involved labs, active participation at the annual

network events, as well as training in complementary skills such as research management. The student will be a part of the Computer Graphics Group of MPI Informatik, see <http://www.mpi-inf.mpg.de>.

Position description: Image Display and Quality Evaluation. The effect of realistic modeling and rendering can be easily ruined by careless image display. While it is clear that even modern displays cannot physically reproduce many characteristics of real-world scenes, we refer here to perceived appearance fidelity and capitalize on relative insensitivities and non-linearities in the human visual system such as limited ability to judge absolute luminance levels, or higher discrimination thresholds for contrast and binocular disparity at larger contrast magnitudes and depth ranges. We intend to complement these cues with binocular depth using stereo 3D displays, as well as motion parallax and the view-dependence of material appearance that can be reproduced on autostereoscopic displays. Specifically, (1) we plan to extend tone mapping operators to handle disparity manipulation as a function of local image content, so that both the perceived contrast and depth losses are minimized, or guided by display-specific constraints such as depth vs. image details reproduction in autostereoscopic displays. Real world or high quality 3D-printed materials can then serve as the ground truth, and guide the display process for rendered HDR/S3D images. Furthermore, (2) we will develop a perception-based fidelity metric which enables prediction of the perceived differences between fabricated objects and rendered counterparts under the same lighting conditions, which in the rendering case are captured as multiple HDR environment maps.

Planned secondments:

[IST Austria](#) (3 months); [Charles University](#) (3 months); [Allegorithmic](#) (4 months)

Eligibility for Hiring. In addition to meeting the formal Ph.D. study enrolment criteria at MPI Informatik (possession of a Master's degree in a relevant area of study), candidates must also fulfil the "mobility requirement" imposed by the EU for ITN networks. Which means that they must not have worked or resided in the Germany for more than 12 months during the three years prior to them joining the project.

Work Environment. The working language within the Computer Graphics Group at MPI Informatik, and of course also within the DISTRO project, is English. In addition to this, M.Sc. and Ph.D. studies in Computer Science at nearby Saarland University are conducted entirely in English. And it is not necessary to speak German in order to live in Saarbrücken as English is widely understood. Free German classes at various levels are provided by MPI Informatik for those who want to improve their German language skills.

Salary. Pay is according to standardised EU rules for ITN grants, which leads to a salary of 3.077,89 € (the net salary ca. 1.971 €) monthly. For applicants with a family the salary amounts to 3.287,39 € (the net salary ca. 2.079 €) monthly.

Application. Inquiries should be directed to Karol Myszkowski (karol@mpi-inf.mpg.de). Applications have to be submitted via e-mail to the same email address until October 30th with the acronym DISTRO in the subject line. The following information has to be attached in a separate PDF file:

1. a CV with a list of publications and/or projects,
2. evidence, such as a scan of the diploma, of having obtained a degree that qualifies the applicant for Ph.D. enrolment,

3. an official transcript of grades obtained during the applicant's bachelor and master studies,
4. a personal statement (up to 2 pages) about the applicants' experience, interests and career goals,
5. and names and contact information of three people who could write a letter of recommendation.