# GERMANY Saarbrücken

# Max Planck-Institut für Informatik MPII

Computer Graphics Group
Max Planck-Institut für Informatik MPII
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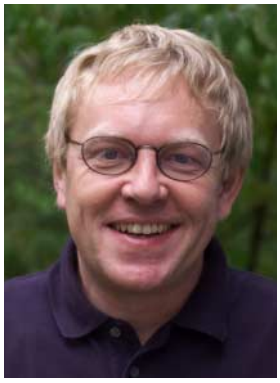
### Core Competence

Computer Graphics, Geometric Modeling, Mesh Processing, free-form Surfaces, Subdivision Surfaces, Multiresolution Modeling, Facial Modeling and Animation, Image Synthesis, Model Acquisition with Realistic Reflection Properties, Image-based and Hardware-accelerated Rendering, Global Illumination, Perception in Rendering and Animation, Visualization of Complex Medical and Engineering Data, Foundations of Virtual Reality, 3D Image Analysis and -Synthesis



Head of the Institute
Hans-Peter Seidel

### History

The computer graphics group at MPI has been newly established in 1999 with the appointment of Prof. H.-P. Seidel, when the core of the group has moved from Erlangen University to MPI. Within the last three years 11 former members of the group (P. Bekaert, T. Ertl, S. Ghali, G. Greiner, W. Heidrich, L. Kobbelt, A. Kolb, P. Slusallek, C. Soler, M. Stamminger, R. Westermann) have received offers for faculty positions in Germany and abroad.

### Staff

*1 Director*: Hans-Peter Seidel
*3 Senior scientists* (C3): Marcus Magnor, Karol Myszkowski, Alexander Belyaev

*2 Secretaries*: Sabine Budde, Judith Selig
*1 Project coordinator*: Christel Weins
*25 Research associates*

### Rooms and Locations

The group has full access to the infrastructure at MPI Informatik. Lab infrastructure includes the graphics lab, the 3D acquisition lab, and the recently established visualization room.

### Financing

Base funding provided by the Max Planck Society. In addition, the computer graphics group has received external funding from the European Community (EU), the German Federal Government (BMBF), the German National Science Foundation (DFG), NATO, and the German-Israel Foundation (GIF), among others.

### Current Structure and Important Partners

In contrast to the classic approach to computer graphics which takes as input a scene model - consisting of a set of light sources, a set of objects (specified by their shape and material properties), and a camera - and uses simulation to compute an image, we like to take the more integrated view of 3D Image Analysis and Synthesis for our research, and consider the whole pipeline from data acquisition over processing to rendering in our work. In our opinion, this point of view is necessary in order to exploit the capabilities and perspectives of modern hardware, both on the input (sensors, scanners, digital photography, digital video) and output (graphics hardware) side. According to this point of view, one of the key

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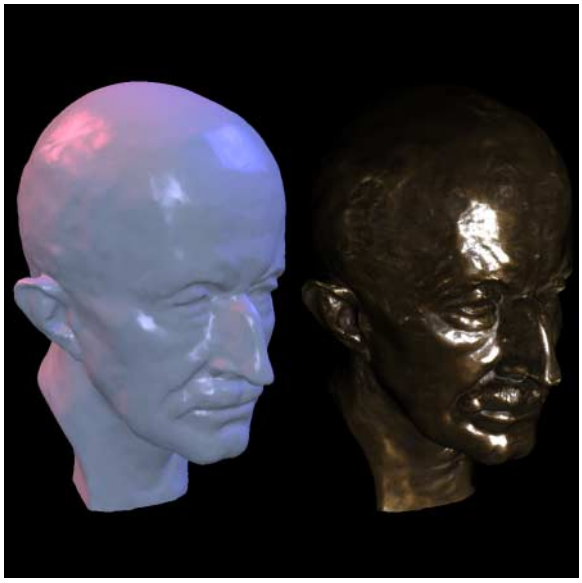
research challenges then is the development of good models and modeling tools to efficiently handle the huge amount of data during the acquisition process and to facilitate further processing and rendering. The group closely collaborates with the computer graphics group at Saarland University (chaired by Prof. Ph. Slusallek) and with the other research groups within MPI as well as with several institutions in Germany and abroad.

### Current Research

As mentioned above we consider the whole pipeline from data acquisition over processing to rendering in our work. Within this framework our choice of research areas is long-term. We reconsider them, as researchers leave and as new opportunities arise. Hiring decisions on all levels (PhD students, postdocs, research associates) are made on quality and fit into our research program. Our research is currently organized into the following eight research areas:
Mesh Processing Free-Form Surfaces, Subdivision Surfaces, and Shape Analysis Facial Modeling and Animation Model Acquisition with Realistic Reflection Properties Image Based Rendering and Motion from Video Realistic Hardware-Supported Shading and Lighting Global Illumination Perception Issues in Rendering and Animation For further details, see:
www.mpi-sb.mpg.de/units/ag4/summary/

### Important Recent Project Participations

- "ViHAP3D" (Virtual Heritage: High-Quality 3D Acquisition and Presentation - EU)
- "MINGLE" (Multiresolution in Geometric Modeling - EU)
- "SIMULGEN" (Realistic Simulation of Light in General Environments - EU)
- Compact Representation and Efficient Processing of Very Large Triangle Meshes (GIF)
- "V3D2" (Verteilte Verarbeitung und Vermittlung Digitaler Dokumente - DFG SPP)



### Important Recent Industrial Partners

Siemens, Motorola, Mercedes-Benz, BMW, Minolta

### Future of the Lab

Our work is both theoretical and applied with a focus on first class basic research on new algorithms, the integration of new algorithms into systems, and the evaluation of the system in practical applications. We also try to provide a stimulating environment for junior researchers that allows them to develop and build their own research programs and groups.