



# Fakultät für Ingenieurwissenschaften und Informatik

## Informatik-Fachvortrag

**Freitag, den 16. Juli 2010, 10 Uhr c.t.**  
Universität Ulm, Oberer Eselsberg  
Gebäude O27, Raum 3211

**Herr Dipl.-Inf. Martin Bokeloh und Herr Dr. Michael Wand**  
MPI Informatik & Uni Saarbrücken

spricht zum Thema

## **Geometry, Correspondences, and Inverse Procedural Modeling**

Our everyday surrounding consists of large quantities of geometry. One of the big mysteries in modern science is how humans are able to make sense of all of this, and understand the structure of the environment they live. The long term goal of the research direction we are following is to address some of these questions by finding algorithms that can fully- or semi-automatically detect and utilize structure in geometric data.

Obviously, this is a very difficult problem. Therefore, we are currently looking at low-level problems. In particular, we have looked at correspondence problems where the goal is to determine whether two pieces of geometry are similar and which points correspond to each other. We will give an overview of techniques developed for addressing this questions and what model assumptions and algorithms have been shown to be useful in this context. In the second part, we will highlight an interesting recent result: After having computed a number of *partial symmetries* (i.e., correspondences between parts of one and the same object), our technique is able to fully automatically compute a shape grammar that encodes a class of similar objects. This means, the algorithm is able to automatically create variations of shapes from a single exemplar as training input. In some sense, this gives us a simple form of shape understanding: By decomposing an object into elementary building blocks and their connecting elements, we can find an algorithm that can describe a larger set of objects that are structurally similar. In practical experiments, this actually turns out to work quite well: despite being just based on local low-level similarity, we usually get quite plausible shape variations by this approach.

The talk will consist of two parts. The first part will be given by Michael Wand, the second part (computing grammars from example data) by Martin Bokeloh.

Es laden ein die Dozenten der Fakultät für Ingenieurwissenschaften und Informatik.

Ulm, den 12.07.2010

gez. Prof. Dr. H. Lensch