



THE 17<sup>TH</sup> INTERNATIONAL CONFERENCE  
ON ENGINEERING DESIGN

**Organized By**

The Center for Design Research at Stanford University  
and the Design Society

# CONFERENCE PROGRAM

24-27 AUGUST 2009  
STANFORD, CALIFORNIA, USA  
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# WEDNESDAY

## 26 AUGUST 2009

Chair: *Ozgur Eris*  
Location: *Hewlett 201*

### SESSION W3-IP1

#### Information Storage & Retrieval

#### ■ 8-183: Visual Browsing in Product Development Processes

*Raiko Eckstein, Andreas Henrich*  
*University of Bamberg, Germany*

In modern product development a wealth of knowledge is developed and stored in electronic form which leads to challenging retrieval tasks. Opposing to that, companies need to reduce development times and costs to stay competitive. Therefore, it is necessary to reuse existing knowledge in the company that comprises existing parts and components amongst others. This paper introduces an exploratory approach to support engineers in retrieval tasks in product development. We present a search engine prototype which employs data visualization techniques to expand the idea of browsing and faceted search. We propose the usage of parallel coordinates plots known from multi-dimensional data visualization as a method for issuing faceted search queries. Next to the higher expressiveness of the possible queries which can be stated, the introduced solution offers better visual insight about the artifacts from product development. Additionally, we introduce ways to influence rankings by user preference functions which help weighting the search criteria.

#### ■ 8-147: Function-Based Solution Retrieval and Semantic Search in Mechanical Engineering

*Andreas Gaag, Andreas Kohn, Udo Lindemann*  
*Technische Universität München, Germany*

Providing relevant information at the right time to the right person is a key-factor for successful products and for efficient processes in mechanical engineering. To support the information chain in the area of product development – and especially in retrieving existing solutions – different approaches exist (e.g. keyword search). Nevertheless, various barriers still hinder a fast and easy access to information about existing solutions.

The presented research approach improves knowledge reuse in the intra- or inter-enterprise information exchange by using semantic technologies. The access to relevant information about possible solutions bases on describing solutions by functions. These functions are abstracted and structured according to their goals. The function-based description is realized in an ontology model, based on classifications and standards used in German industries. Undertaking the first step, the ontology is built by extracting relevant concepts from different documents. The presented research approach will be used to structure solutions in a web-based electronic-market-platform and provides the access to various solutions from different sectors and enterprises.

