

## **SIKS Conference “Research Methods and Methodologies for IKS” 22-10-2012**

### **11.35 -11.45 Welcome and Introduction**

*Prof. Dr. Hans Akkermans (VU, Chairman Board of Governors SIKS)*

### **11.45-12.25 SIKS: Facts, Figures, Foci and Methodologies**

*Prof. Dr. Paul De Bra (TUE, Scientific Director SIKS) and Dr. Richard Starmans (UU, Managing Director SIKS)*

In this talk several developments and trends in the field of Information and Knowledge Systems will be discussed. Special attention will be paid to methodological issues and the place in SIKS Scientific Program.

### **12.25 – 13.00 Towards an Interactive Intelligence Design Method**

*Prof. Dr. Catholijn Jonker (TUD)*

Catholijn Jonker will present some of the experience of the Interactive Intelligence group of Delft University of Technology to combine and extend existing design methods into a new design method, that designs for systems of humans working together with robots and software agents.

This new method, called the Interactive Intelligence Design Method, or INTERACT for short, is inspired by and goes beyond the design methods such as: Value-Sensitive Design, Cognitive Situated Engineering, Participatory Design, and Agent-Oriented Software Engineering.

Jonker will explain the inspirational value of each of these methods, and discuss some of the problems encountered in designing for Interactive Intelligence.

### **15.00-15.35 Informatics is a natural science**

*Prof. Dr. Frank van Harmelen (VU)*

There is little doubt about the practical impact of Computer Science. Computer Science is an undeniable engineering success, with substantial impact on pretty much every aspect of our lives and on society as a whole. But is it also a bona fide scientific field (as the name suggests)? Have we discovered any general principles? Any universal "laws". Have we uncovered any universal patterns that give us insights into the structure of data, information and knowledge, patterns that are valid beyond the engineering practices of the computers of yesterday, today and tomorrow? And if so, what would such universal "laws" of

computing look like, as compared to the laws of the natural sciences? What are the objects that such laws would govern? And do we actually use the appropriate methodologies in our laboratories to discover any universal laws?

#### **15.40 – 16.15 Empirical Evaluation of Search. Case study: Federated Search Engines**

*Dr. Djoerd Hiemstra (UT)*

In this talk I discuss the tools and methodology for comparing the effectiveness of two or more search engines in a meaningful way. Several aspects of search engines can be evaluated without consulting the potential users or customers of the system, such as the query processing time or the query throughput. In this talk, however, I will focus on aspects of the system that influence the effectiveness of the retrieved results. In order to measure the effectiveness of search results, one must at some point consult the potential user of the system. For, what are the correct results for the query "black jaguar"? Cars, or cats? Ultimately, the user has to decide. As a case study, I discuss a new test collection containing the results from more than a hundred actual search engines, ranging from large general web search engines such as Google and Bing to small domain-specific engines. I discuss the design of the test collection and analyze the effect of several sampling methods.

#### **16.45 – 17.20 Bayesian Machine Learning**

*Prof. Dr. Tom Heskes (RUN)*

Machine learning is about learning models from data. In so-called Bayesian machine learning we build probabilistic models and use probability calculus, in particular Bayes' rule, to infer the unknown model parameters given the observed data. I will discuss some recent algorithmic developments as well as applications in neuroimaging and bioinformatics.

#### **17.25 – 18.00 Technology validation methods for information and knowledge systems**

*Prof. Dr. Roel Wieringa (UT)*

Many PhD projects in SIKS consist of proposing one or more technical solutions for a problem followed by one or more empirical validations of those solutions. The central problem of empirical validation is that it aims to provide information about how the technology would perform under conditions of practice, at a point in time when there is no real-world practical experience with the technology. In this talk I review methods used in SIKS to validate new technology empirically, and compare this with methods used in other engineering science. This will lead to conclusions about two kinds of generalization that one can draw from single validation experiments, and conclusions about risks take when applying such generalizations to practice.