RAND WALTZMAN
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EDUCATION

Graduate:

PhD in Computer Science: August 1989
University of Maryland
College Park, Maryland, USA

Honors Co-op Student
Stanford University, 1984-1985

M.S. in Applied Mathematics: December 1981
University of Washington
Seattle, Washington, USA

Undergraduate:

B.A. in Mathematics: June 1978
University of California at Los Angeles
Los Angeles, California, USA

EXPERIENCE

7/91 - present

Associate Professor
Department of Computer Science (NADA)
Royal Institute of Technology
Stockholm, Sweden

I teach a variety of undergraduate courses in Computer Science. I completely overhauled and taught for several years each of the major computer science courses for the first year (Introduction to Computer Science), second year (Algorithms and Data Structures) and third year (Software Engineering) computer science students. I also created and teach a course called Industrial Applications of Artificial Intelligence designed for senior

undergraduates and graduate students. For the last two years the main topic of the course has been Artificial Intelligence and Digital Entertainment.

I have worked on a number of projects in the area of intelligent computer interfaces experimenting with various techniques. Several projects involved communicating with the user through machine-guided goal-directed conversational dialogs. These dialogs are generated dynamically using rule-based text assembly techniques that I developed. One of these projects was building a conversational agent for use in a game produced by a major computer games studio. In another project, I designed a technique for accessing databases that insulates the user from details regarding the structure and contents of the database itself. My basic approach was to allow a description of the user's specific problem or task to provide the focus for the automatic search, assembly and presentation of data. A key element of my approach was to shift the burden of understanding the structure and contents of the data base from the user to the interface. I presented this work at the Fourth International Conference on the Practical Application of Prolog in 1996. The basic theme in most of my work has been developing ways for the user to experience the computer as a partner in some computational task.

7/01 – 7/05

Consultant
Teknowledge Corporation
4640 Admiralty Way, Suite 231
Marina Del Rey, CA 90292

I had a major role in winning two Phase II DARPA SBIR grants (~ 750K each) and one Phase I DARPA SBIR grant (100K).

The first Phase II grant was in the area of computer security. Using wrapper technology that had been previously developed at Teknowledge as sensors, my partner and I developed computational models of suspicion that we used for model-based intrusion detection. This work resulted in a successful paper that we presented at the 2004 New Security Paradigms Workshop.

The second Phase II grant was in the area of deductive spreadsheets. We exploited the spreadsheet metaphor to make deductive problem-solving methods available to the vast population of spreadsheet end users. In particular, we showed how the function-based problem-solving capabilities of spreadsheets can be extended to include logical deductive methods in a way that is consistent with the existing spreadsheet “look and feel.” My partner and I did this by constructing a working prototype that served as the basis for the Phase II proposal that we won. This work resulted in an invitation to present at the AAAI 2006 Fall Symposium on Integrating Reasoning into Everyday Applications as well as an invitation to submit a full paper to the special issue on Logical Spreadsheets of the Knowledge Engineering Review (which has been accepted for publication).

6/89 - 6/91

Program Manager in Machine Intelligence
Defense Advanced Research Projects Agency (DARPA)
Arlington, Virginia, USA

I managed the DARPA Artificial Intelligence program in Image Understanding. This was a multi-million dollar program. I held the Civil Service rank of GM15.

My responsibilities included planning new research and development programs, obtaining funding for these programs, evaluating and awarding research contracts, and managing ongoing programs. As part of my job I made presentations to a variety of high level government and military officials.

I was the originator of the Image Understanding Environment project whose purpose was to apply established software engineering principles to enable efficient sharing and development of research results from the Image Understanding community. I also managed the development of a specialized version of this environment, known as RADIUS, for use by image analysts in the intelligence community. These environments and the framework that I created for coordinating and combining research efforts across commercial, government and academic communities served as a model for other DARPA projects.

2/88 - 5/89

Guest Researcher
Artificial Intelligence Center
SRI International (Stanford Research Institute)
Menlo Park, California, USA

I wrote my PhD thesis on geometric problem solving using techniques that I developed for manipulating analogical representations.

9/85 - 5/89

Faculty Research Assistant
Center for Automation Research
University of Maryland
College Park, Maryland, USA

I conducted research in the field of artificial intelligence, specifically in three dimensional spatial reasoning and geometric problem solving by machine. I studied the relationship between object representation and problem-solving knowledge

representation. In this connection I developed new techniques for reasoning with analogical representations.

3/83 - 8/85

Knowledge Engineer
Teknowledge Corporation
Palo Alto, California, USA

My activities at Teknowledge included the following:
Develop non-standard expert systems applications in the R&D department.
Create educational materials and teach courses in the use of one of the company's expert system building tools, S.1.
Work as a member of the development and implementation team for another Teknowledge expert system building tool, M.1.
Work as a member of a three man team that built a commercial expert system prototype for planning financial audits.
Evaluate potential commercial expert system projects and write proposals.
Program extensively in Lisp and Prolog and use several high level expert system building tools.

6/81 - 2/83

Mathematician
Applied Physics Laboratory
Seattle, Washington, USA

I worked on the analysis of underwater acoustic data using a variety of signal processing techniques. I also developed a rule-based expert system for assisting in the selection of acoustic transducers. One of the most interesting features of this system was the novel use of a user-model that was automatically modified during the course of a consultation with the system. The user-model was used to formulate questions to the user about information that the program decided it needed. The way the user answered these questions, in turn, influenced the automatic modification of the user-model.

PUBLICATIONS

R. Waltzman, K. Winbladh, T. A. Alspaugh, and D. J. Richardson, “In the Requirements Lies the Power”, SEKE 2007 International Conference on Software Engineering and Knowledge Engineering, Boston, Massachusetts.

M. Tallis, R. Waltzman, and B. Balzer, “Adding Deductive Logic to a COTS Spreadsheet

(abbreviated paper)", AAAI 2006 Fall Symposium on Integrating Reasoning into Everyday Applications, Arlington, Virginia.

M. Tallis, R. Waltzman, and B. Balzer, "Adding Deductive Logic to a COTS Spreadsheet (full paper)", The Knowledge Engineering Review, *soon to be published*.

T. Hollebeek and R. Waltzman, "The Role of Suspicion in Model-based Intrusion Detection", Proceedings of the New Security Paradigms Workshop 2004, Nova Scotia.

R. Waltzman and S. Bergh, "A Critiquing Approach to Data Retrieval", Proceedings of the Fourth International Conference on the Practical Application of Prolog, London, April 1996.

R. Waltzman, "Geometric Problem Solving by Machine Visualization", PhD Thesis, Computer Science Department, University of Maryland, October 1987.

R. Waltzman, "Finding Symmetries of Polyhedra", Technical Report, CAR-TR-333, Computer Vision Lab, University of Maryland, October 1987.

R. Waltzman and E.I. Thorsos, "Bistatic Surface Backscatter in the Open Ocean", APL Report, Applied Physics Laboratory, University of Washington, 1982.

W.P. Schaefer, R. Waltzman, and B.T. Huie, "Formation of a Cobalt-Carbon Bond under Mild Conditions. Preparation and Crystal Structure of an Acetonyl Adduct of N,N'Ethylenebis(3-fluorosalicylideniminato)cobalt(II)", Journal of the American Chemical Society, 100, 5063(1978).

SKILLS

Natural Languages: German, Modern Greek, Spanish, and Swedish.
Programming Languages: Java, C#, JESS, Lisp, Prolog, Ruby.
Web Technologies: XML, HTML
Software Tools: Eclipse, Visual Studio .NET.
Management: Formulating and managing small to large research and development projects.

OUTSIDE INTERESTS

Playing the harpsichord (Baroque music). Greek and Balkan folk dancing. Reading science fiction books and watching science fiction films.