

Marshall R. Mayberry, III
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U.S. Citizen

Education

PhD, Computer Science - *University of Texas at Austin* (2003)
MS, Computer Science - *University of Texas at Austin* (1995)
BS, Computer Science; BS, Mathematics - *University of Texas at Austin* (1993; Highest Honors)

Honors

- Outstanding Teaching Assistant Award, 2002.
- National Science Foundation Fellowship, 1994/1996/1998.
- Participant in Summer Institute in Japan program, 1998.
- Micro-Electronics and Computer Development Fellowship, 1993/1995.
- Dean's Graduate Student in Computer Science Department, 1993.
- Endowed Presidential Scholarship, 1992-93.

Work and Research Experience

Jun 03–Present *Saarland University*, Saarbrücken, Germany

Scientific Researcher Neural network research on the *Adaptive Mechanisms for Human Language Processing* project led by Prof. Dr. Matthew Crocker as part of the SFB-378 program, *Resource-Adaptive Cognitive Processes*. Development of a connectionist model of the interaction of spoken language and visual scenes that exhibits five hallmark characteristics of cognitive behavior: incremental interpretation, anticipation of upcoming role fillers, and the integration, adaptation, and coordination of multimodal information sources as revealed by eye-tracking experiments.

Mar 07–Apr 07 *Hewlett Research, Inc.*, Palo Alto, CA

Consultant Clustered and classified video descriptions mined from sites such as YouTube using latent semantic indexing and multidimensional scaling for visualization.

Dec 98–Jun 03 *University of Texas*, Austin, TX

PhD Candidate Dissertation research under the supervision of Dr. Risto Miikkulainen using a neural network model to semantically parse VerbMobil sentences from the LinGO Redwoods Treebank into their Minimal Recursion Semantics dependency graphs, while retaining important cognitive characteristics such as incrementality, anticipation, and robustness.

May 00–Aug 00/May 01–Aug 01 *Stanford Medical Informatics, Stanford University*, Palo Alto, CA

Consultant Development of servlet code in Java to function as a web-interface with Protégé to the Pharmacogenetics Knowledge Base (PharmGKB) under development at the SMI laboratory. Preliminary research using statistical methods to populate PharmGKB with information from Medline, as well as coupling the PharmGKB Java code with the *Jess* Rule Engine.

Jun 98–Aug 98 *Advanced Telecommunications Research Institute International*, Kyoto, Japan

Visiting Research Scientist Applied connectionist techniques to the segmentation and POS-tagging of Japanese text as a member of the NSF/STA-sponsored Summer Institute in Japan program.

- May 95–Aug 95 *Nijmegen Institute for Cognition and Information*, Nijmegen, the Netherlands
Visiting Research Scientist Assisted in the development of a hybrid connectionist-symbolic system which integrated handwriting-recognition technology with a Scheme parser to demonstrate the feasibility of using context to facilitate recognition.
- May 93–May 94 *University of Texas*, Austin, TX
Research Scientist Assistant Proved open ten-year-old conjecture regarding the ground completeness of first-literal hyperresolution proposed by Dr. Woodrow Bledsoe in 1983. Further work on completeness of SETVAR, an extension of resolution able to handle many important theorems expressible in a subset of second-order logic.
- Nov 92–May 93 *TRP Consulting*, Austin, TX
Computer Systems Engineer Design and implementation of various business applications in the Progress Database language.
- May 88–Jun 90 *Martin Marietta Data Systems*, San Antonio, TX.
Computer Systems Designer Two years' experience on a large-scale advanced development project to design, develop, and maintain application programs in Model204, Fortran77, and COBOL on the IBM 4341 mainframe. Top Secret SCI+ clearance, last updated in November, 1987.
- Jul 82–Mar 88 *United States Air Force*, Kelly AFB, TX; Berlin, West Germany
Russian Linguist Performed interpretation and analysis of all-source intelligence reports in support of foreign and domestic weapons systems. Top Secret SCI+ clearance.

Selected Publications and Invited Talks

- Marshall R. Mayberry, III, Matthew W. Crocker, and Pia Knoeferle (accepted). Learning to Attend: A Connectionist Model of Situated Language Comprehension. *Cognitive Science*
- Marshall R. Mayberry, III, and Matthew W. Crocker (2007). An Attentional Model of Situated Language Understanding. Presented at: *The 13th Annual Conference on Architectures and Mechanisms for Language Processing*, Turku, Finland.
- “A Connectionist Model of Covert Attention in Situated Language Comprehension”, Freiburg, Germany, July 18, 2007.
- “Connectionist Models of Sentence Comprehension in Context”, EuroCogSci07, Delphi, Greece, May 25, 2007.
- Marshall R. Mayberry, III, Matthew W. Crocker and Pia Knoeferle (2006). A Connectionist Model of the Coordinated Interplay of Scene, Utterance, and World Knowledge. *Proceedings of the 28th Annual Conference of the Cognitive Science Society*, (CogSci-06, Vancouver, Canada), Mahwah, NJ: Erlbaum.
- Marshall R. Mayberry, III, and Risto Miikkulainen (2005). Broad-Coverage Parsing with Neural Networks. *Neural Processing Letters*; 21:121-132.
- Marshall R. Mayberry, III (2004). Incremental Nonmonotonic Parsing through Semantic Self-Organization. PhD Thesis. Department of Computer Sciences, University of Texas at Austin. AI-TR-04-310.
- Marshall R. Mayberry, III, and Risto Miikkulainen (2003). Incremental Nonmonotonic Parsing through Semantic Self-Organization. *Proceedings of the 25th Annual Conference of the Cognitive Science Society*, (CogSci-03, Boston, MA), Mahwah, NJ: Erlbaum.
- Marshall R. Mayberry, III, and Risto Miikkulainen (2000). Combining Maps and Distributed Representations for Shift-Reduce Parsing. In Wermter S., Sun R. (eds), *Hybrid Neural Symbolic Systems*, Springer: Heidelberg, Germany.
- Risto Miikkulainen and Marshall R. Mayberry, III. (1999). Disambiguation and Grammar as Emergent Soft Constraints. In B. J. MacWhinney (editor), *Emergentist Approaches to Language*, Hillsdale, NJ: Erlbaum.
- Marshall R. Mayberry, III. (1997) On the Completeness of FLH-Resolution. Technical Report TR-97-26, Department of Computer Sciences, University of Texas at Austin.

Professional Service

- Program Committee member for
 - *The Twenty-First International Conference on Machine Learning* (2004)
 - *The Twenty-Second Conference on Artificial Intelligence* (2007)
- Reviewer for
 - *Special Issue of the Journal of Machine Learning Research: Machine Learning Approaches to Shallow Parsing* (2001)
 - *Journal of Artificial Intelligence Research* (2002)
 - *Trends in Cognitive Sciences* (2002)
 - *Neural Networks Special Issue: New Developments in Self-Organizing Systems* (2004)
 - *The Twenty-Eighth Annual Conference of the Cognitive Science Society* (2006-2008)
 - *Cognition* (2007)
- Member of the Association for Computing Machinery and the Cognitive Science Society.

Teaching

- *Computational Psycholinguistics*, with Matthew W. Crocker.
- *Mathematical Foundations, III: Statistical Methods*, with Matthew W. Crocker.
- *Introduction to Psycholinguistics*, seminars on parsing strategies
- *Introduction to Computational Linguistics*, seminars on neural networks.

Software Packages

Mir Sentence Processing package for rapid prototyping of typical architectures used in NLP research such as the simple recurrent network and self-organizing map.

SignalSim The SignalSim Spiking Neuron package is a Tcl/Tk GUI built on top of an event-driven simulator of an interconnected network of spiking neurons.

Skills

Systems Administration: Mac OS X, Linux, some MS Windows.

Computer Languages: C, TK/Tcl, Perl, Java, C++, Prolog, LISP, Fortran, Scheme.

Software: MatLab, Mathematica, L^AT_EX, R, and many more specialized tools.

Natural Languages (years of formal study and exposure):

- Spanish (19): not quite fluent, but very conversant: my wife is a native speaker
- German (7): conversant: have lived in Germany over six years altogether
- Russian (4): not fully conversant, but advanced college-level proficiency
- Japanese (3): basic college-level proficiency

Personal: Happily married for over 18 years; interests include the melody of living languages, beautiful mathematics, fascinating computers and gadgets, tournament chess, world-wide travelling, classical and folk guitar, and the never-ending endeavor to contribute to the well-being of society.

References furnished upon request