David Goddeau

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Degrees

Massachusetts Institute of Technology   **Cambridge, MA**

Ph.D. in Computer Science   **1993**
Thesis research under V. Zue on "An LR Parser-Based Probabilistic Language Model for Spoken Language Systems". Minor program in Molecular Biology.

M.S. in Computer Science   **1984**
Thesis under Prof. S.A. Ward on "A Multiple Processor Implementation of the TRIX Operating System".

B.S. in Computer Science   **1979**

Employment

Wellington Management Co., Boston MA   **Apr. 2006 - present**
Vice President, Quantitative Analyst for Quantitative Investment Group with three areas of responsibility: continuing development of the group's C#.NET platform used research and operations, supporting Portfolio Managers in new product development, backtesting, and portfolio construction, and investigating new ideas in alpha capture, risk modeling and portfolio construction. Recent contributions include integrating new data sources into research platform (IBES, BIM, Holt, Markit), launching C# production infrastructure for portfolio optimization, evaluating alternative risk models, backtesting new products (130/30, Islamic, SRI), simulating proposed allocation algorithm, and analyzing transaction costs for group portfolios.

Hewlett Packard (CRL), Cambridge, MA   **Jan. 2003 to Oct. 2005**
Research scientist in Hewlett Packard's Cambridge Research Laboratory developing new applications related to healthcare and life-sciences. Architect and developer for BioStream, a J2EE-based system for collecting, analysing, storing and visualizing ECG data from wireless sensing devices. With two colleagues, assumed responsibility for Talisman patient monitoring system consisting of wireless ECG devices, communications relay devices, the BioStream system, and automation and monitoring software. Completed prototype system development and brought to clinical trial with hospital partner. Other projects include classification of protein mass spectra, stochastic simulation of cluster scheduling, and induction of transcription factor binding sites using Hidden Markov Models.

Compaq Computer Corp (CRL), Cambridge, MA   **Jun. 1996 to Feb. 2000**
Research lead for SpeechBot (www.compaq.com/speechbot), the first search site for streaming spoken audio on the Web, launched Dec.99. Project leader for Speech Recognition Project at CRL investigating new applications for large vocabulary speech recognition. Developed and implemented Web-based conversational systems technology, including natural language parsing and generation, semantic interpretation, discourse and dialog modeling, response planning, and Web-based architecture.

MIT Laboratory for Computer Science, Cambridge, MA   **Jan. 1989 to Jun. 1996**
Graduate Student, then Research Scientist with Spoken Language Systems Group. Conceived and developed the GALAXY architecture for distributed spoken-language access to on-line information and services. GALAXY represented an advance over current spoken language architectures in that it was distributed, multi-domain, and extensible. Implemented initial version of protocols, X-based client program, and several prototype knowledge servers. Initial demonstration of prototype system at ARPA HLS meeting 1994 and the 1995 World Economic Forum in Davos.

Other accomplishments include: development of semantic representation language and support library for SLS language understanding and generation systems, development of fast-match and search algorithms for the SUMMIT speech recognition system, development of semantic interpretation tool for construction of conversational system back ends. Contributed to SLS entry for ARPA evaluation (ATIS) of speech and language technology, particularly in the area of statistical language modeling for speech recognition.

Hewlett Packard Labs., Palo Alto, CA   **Jan. 1985 to Jan. 1987**

Member of Technical Staff at HP-Labs in Palo Alto. Worked in Natural Language Group developing a system to parse and interpret English sentences with emphasis on database query. Developed and implemented linguistic treatment of constituent coordination. Designed and implemented several system modules including, inheritance language for representing linguistic feature hierarchies, lexical rule module, semantic disambiguation module, and module to translate semantic expressions into relational database queries.

Consulting

Independent consultant specializing in product and system development.

Wellington Management Co., Boston MA   **Nov. 2005 - Apr. 2006**

Consultant with Quantitative Investment Group working on RStation, a C#.NET platform linking security databases, business objects and algorithms with a thick-client GUI. Contributions include options implementation, optimized backtest framework, GUI controls, and univariate analytics.

Knumi Inc., Boston MA   **Nov. 2001 - Nov. 2002**

Hired as consultant to define and develop a J2EE architecture and product for creating and delivering spoken dialog applications for sales force support. Key features of the system were: abstract data model and integration layer, dialog description language for rapid application development, and output rendering layer supporting VoiceXML and SALT. The system was implemented, used internally to develop sales force applications for Knumi clients, and eventually transferred to a Knumi customer.

SpeechWorks Intl., Boston, MA   **Apr. 2000 - Jun. 2001**

Worked as independent consultant and FTE on the company's strategy surrounding the VoiceXML spoken dialog mark-up language. Designed and produced the OpenVXI Open Source VoiceXML interpreter and a working integration with SpeechWorks products. Supported users with software updates and feature enhancements. Developed a framework for server-side speech application development for VoiceXML and managed the production of a demonstration application using this framework. Assisted marketing and sales with VoiceXML and related technologies.

Proconics International, Woburn, MA   **Sep. 1981 to Jun. 1989**

Designed and implemented control software for a robot designed to transfer wafers in semiconductor fabrication facility. Produced prototype system for initial delivery and provided support for permanent software staff. Developed specification and communication interface for software package to automate diffusion areas in semiconductor manufacturing.

Mytrix Systems, Cambridge MA   **Sep. 1983 to Jan. 1985**

Consulting work on UNIX operating system for several clients.

Teaching

Speechworks Institute, Cambridge, MA   **Dec 2001**
Developed a 1-day course on VoiceXML at SpeechWorks Institute. Course covered VoiceXML basics and included student exercises on OpenVXI platform.

ArsDigita University, Cambridge, MA   **Jan 2001**
Designed, developed and taught an intensive 1-month course on Object-Oriented Programming in Java. Course covered basics of OOP as well as advanced topics in network, multi-threaded and GUI programming. Students completed several programming projects as part of the course. Course available on-line at `http://www.aduni.org/courses/java`.

Massachusetts Institute of Technology, Cambridge, MA   Spring 1982, to Spring 1988
Recitation instructor [4 semesters] for undergraduate core course on Computer Architecture. Responsibilities included presenting new material, reviewing lecture material, and problem set and quiz problem generation.

Lowell Institute School, Cambridge, MA   **Feb. 1977 to Dec. 1981**
Laboratory teaching assistant for introductory digital electronics course meeting one night per week.

Publications

Van Thong, J.M., Logan, B., and Goddeau, D., "Real World Indexing Systems", *Proceedings IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, March 2005.

Logan, B., Kontothanassis, L., Goddeau, D., Moreno, P., Hookway, R. and Sarracino, D., "Reducing the Cost of Protein Identifications from Mass Spectrometry", *IEEE Engineering in Biology Society Conference*, September 2004. (Appears as Technical Report HPL-2004-139).

Bar-Or, A., Goddeau, D., Healey, J., Kontothanassis, L., Nelson, A., Van-Thong, J.M., "BioStream: A System Architecture for Real-Time Processing of Physiological Signals", HPLabs Technical Report HPL-2004-128, 2004.

Stitziel, N.O., Tseng, Y.Y., Pervouchine, D., Goddeau, D., Kasif, S., Liang, J., "Structural Location of Disease-Associated Single-Nucleotide Polymorphisms.", *J Mol Biol.* 2003 Apr 11;327(5):1021-30. PMID: 12662927

Eberman, B., Carter, J., Meyer, D., Goddeau, D., "Building VoiceXML Browsers with OpenVXI", *Proceedings of the eleventh international conference on World Wide Web* Honolulu, Hawaii, 2002, pp 713-717

Goddeau D., and Pineau, J., "Fast Re-inforcement Learning of Dialog Strategies", *Proc. ICASSP 2000*, Istanbul, Turkey, June 2000.

Van Thong, J-M, Goddeau, D., Litvinova, A., Logan, B., Moreno, P., and Swain, M., "SpeechBot: A Speech Recognition Based Audio Indexing System for the Web", *International Conference on Computer-Assisted Information Retrieval, Recherche d'Informations Assistee par Ordinateur (RIAO)*, Paris, April 2000, pp 106-115

Ghosh, D., and Goddeau D., "Automatic grammar Induction from Semantic Parsing", *Proc. ICSLP 98* Sydney, Australia, Dec 1998.

Goddeau, D., Goldenthal, W., and Weikart, C., "Deploying Speech Applications over the Web", *Proc. Eurospeech 97*, Rhodes, Greece, 1997.

Goddeau, D., Meng, H., Polifroni, J., Seneff, S., and Busayapongchai, S., "A Form-Based Dialog Manager for Spoken Language Applications", *Proc. ICSLP 96*, pp 701-705, Philadelphia PA, Oct, 1996.

Meng, H., Busayapongchai, S., Glass, J., Goddeau, D., Hetherington, L., Hurley, E., Pao, C., Polifroni, J., Seneff, S., and Zue, V., "WHEELS: A Conversational System in the Automobile Classifieds Domain" *Proc. ICSLP 96*, Philadelphia PA, Oct, 1996.

Seneff, S., Goddeau, D., Pao, C., and Polifroni, J., "Multimodal discourse modelling in a multi-user multi-domain environment", *Proc. ICSLP 96*, Philadelphia PA, Oct, 1996.

Glass, J., Goddeau, D., Hetherington, L., McCandless, M., Pao, C., Phillips, M., Polifroni, J., Seneff, S., and Zue, V., "The MIT ATIS System: December 1994 Progress Report", *Proc. ARPA Spoken Language Workshop*, Austin, Texas, Jan. 1995.

Seneff, S., Zue, V., Polifroni, J., Pao, C., Hetherington, L., Goddeau, D., Glass, J., "The Preliminary Development of a Displayless PEGASUS System", *Proc. ARPA Spoken Language Workshop*, Austin, Texas, Jan. 1995.

Goddeau, D., Brill, E., Glass, J., Pao, C., Phillips, M., Polifroni, J., Seneff, S., and Zue, V., "GALAXY: A Human-Language Interface to On-line Travel Information", *Proceedings of the International Conference on Spoken Language Processing*, Yokohama, Japan, Sept. 1994.

Phillips, M. and Goddeau, D., "Fast Match for Segment-based Large Vocabulary Continuous Speech Recognition", *Proceedings of the International Conference on Spoken Language Processing*, Yokohama, Japan, Sept. 1994.

Zue, V., Seneff, S., Polifroni, J., Phillips, M., Pao, C., Goddeau, D., Glass, J., and Brill, E., "Pegasus: A Spoken Language Interface for On-Line Air Travel Planning", *Proc. ARPA Human Language Technology Workshop*, Princeton, NJ, March 1994.

Zue, V., Seneff, S., Polifroni, J., Phillips, M., Pao, C., Goddeau, D., Glass, J., and Brill, E., "The MIT ATIS System: December 1993 Progress Report", *Proc. ARPA Spoken Language Technology Workshop*, Princeton, NJ, March 1994.

Goddeau, D., *An LR Parser-Based Probabilisitic Language Model for Spoken Language Systems*, Ph.D. Thesis, MIT, Feb 1993.

Goddeau, D., "Using Probabilistic Shift-Reduce Parsing in Speech Recognition Systems", *Proc. ICSLP 92*, Banff, Alberta, Canada, October, 1992.

Goddeau, D., and Zue, V., "Integrating Probabilistic LR Parsing into Speech Understanding Systems", *Proc. ICASSP 92*, San Francisco, CA, March, 1992.

Zue, V., Glass, J., Goddeau, D., Goodine, D., Hirshman, L., Phillips, M., Polifroni, J., Seneff, S., "The MIT ATIS System: February 1992 Progress Report", *Proc. Fifth DARPA Speech and Natural Language Workshop*, Harriman, NY, Feb 1992.

Zue, V., Glass, J., Goddeau, D., Goodine, D., Hirshman, L., Leung, H., Phillips, M., Polifroni, J., Seneff,S., "Spoken Language Systems for Human/Machine Interfaces", *Proc. RIAO-91*, Barcelona, Spain, April, 1991.

Seneff, S., Glass, J., Goddeau, D., Goodine, D., Hirshman, L., Leung, H., Phillips, M., Polifroni, J., Zue, V. "Development and Preliminary Evaluation of the MIT ATIS System", *Proc. Fourth DARPA Speech and Natural Language Workshop*, Asilomar, CA, Feb 1991.

Zue, V., Glass, J., Goddeau, D., Goodine, D., Leung, H., McCandless, M., Phillips, M., Polifroni, J., Seneff, S., Whitney, D., "Recent Progress on the MIT VOYAGER Spoken Language System", *Proc. ICSLP 90*, Kobe, Japan, November 1990.

Proudian, D. and Goddeau, D., *Constituent Coordination in HPSG.* Center for the Study of Language and Information, CLSI-87-97, May 1987.

Theses Supervised

Chang, A., "Part-of-speech Based Language Models for Speech Recognition", M.Eng. MIT 2000

Ghosh, D., "Semantic Parsing Based Grammar Induction", M.Eng. MIT 1998

Serridge, B., "A Parametric Analysis of the SUMMIT Speech Recognition System", B.S. MIT 1995

Patents

"Cardiac Diagnostic System Combining Cardiologist Knowledge and Machine Learning"
Co-Inventors: Pedro J. Moreno and Beth T. Logan
Status: Pending (2004)

"Computer Method and System for Reading and Analyzing ECG Signals"
Co-Inventors: Beth T. Logan and Pedro J. Moreno
Status: Pending (2004)

"Method And System For Guiding Scheduling Decisions In Clusters Of Computers Using Dynamic Job Profiling"
Co-Inventors: Leonidas Kontothanasis, Richard Flower and Rivka Ladin
Status: Pending (2004)

"Content-based Synchronization Method for Datastreams"
Co-Inventors: Leonidas Kontothanasis and JM Van Thong
Status: Pending (2004)

"Apparatus for Aligning Circular Objects"
Status: US Patent No. 4,765,793, Issued Aug. 23, 1988.

Talks

"Conversation Access to the Information Superhighway", (with V. Zue), 4th. WWW Conference. Boston MA, Dec. 1995.

"GALAXY: Spoken Language Access to On-Line Information", DEC CRL, April 1995.

"GALAXY: Spoken Language Access to On-Line Information", Language Technology and the Information Highway meeting, Santorini, Greece, Sept 1994.

GALAXY demonstration, ARPA HLT Conference March 1994,

"Probabilistic Language Modelling for Spoken Language Systems", Speech Group at University of Aalborg, Denmark, Sept 1993.

"Probabilistic Language Modelling for Spoken Language Systems", Speech Group at Cambridge University, Cambridge, UK, June 1993.

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