

Jordan R. Cohen

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FUNCTIONAL SUMMARY

Practical Applications of Technology

- As independent SPELAMODE consultant
 - Created a research organization at Cisco and a support group for Audience
 - Solved speech recognition signal processing issues for Audience and Telenav.
 - Testified as expert witness for Vlingo (Nuance vs Vlingo, Boston, 2011),
 - Retained for Intellectual Property search and analysis by several firms
 - Serve as CTO of Kextil and as Chief Scientist of Speech Morphing
- As Principal Investigator for GALE at SRI
 - Applied speech and language technology to military applications (\$12M annual budget with 14 sub-contractors).
 - Advised the SRI Commercialization Board speech technology applications to mobile devices.
- As CTO of Voice Signal
 - Developed and managed intellectual property program, including patent production, pursuit, litigation, and strategy, which created more than 40 patents in 3 years.
 - Co-authored 13 granted patents, several more pending.
- As a staff member at the Institute for Defense Analyses
 - Designed, funded, and co-chaired two summer workshops in the application of speech recognition techniques to realistic environments at CAIP/Rutgers in Summers, 1993 and 1994. (DARPA funded, 30 researchers for 6 weeks). Program continues annually at Johns Hopkins.
 - Developed Vocal Tract Length Normalization, now used in all major speech systems.
- While a staff member at IBM
 - Developed the first successful auditory front end for a large scale speech recognition system.

Speech, Signals, and Algorithm Development in Department of Defense and related industries

- 24 years experience at NSA and IDA
 - Areas of expertise: Hillclimbing, Dynamic Programming, Signal Processing, Probabilistic Analysis, Speech and Language Technology
 - Two Letters of Commendation and NSA Special Achievement Award
 - Four awards for development and application of novel cryptanalytic techniques at IDA

Corporate Advice and Governance

- Reviewed papers and proposals for DARPA, NSF, IEEE, Eurospeech, European Union Framework 6
- Serve on the Industrial Advisory Committee, IDIAP (Swiss Government Research Institute)
- Serve on the Industrial Advisory Board of Sensory, Santa Clara, CA
- Serve on the Technical Advisory Board, Center of Excellence in Human Language Technology, JHU
- Former consultant advisor to Yap (now part of Amazon), a speech recognition company in Charlotte, NC
- Past member of Board of Directors at the International Computer Science Institute, Berkeley, CA
- Served as advisor to CLSP (Center for Speech and Language Processing, JHU) and CAIP at Rutgers

EMPLOYMENT DETAILS

2009- **SPELAMODE** (SPEech, LAnguage, and MObile DEvices) **Consulting**, Kure Beach NC

Title: Founder and Technologist

- With Patti Price, created a research organization for Cisco in Speech and Language Technology.
- Created robust signal processing solutions for Audience to enhance Speech Recognition performance.
- Resolved performance problems in Telenav speech processing systems.
- Advised and managed Automatic Speech Recognition portion of a potential multi-million dollar proposal for Basis Technologies.

- Currently serving as Chief Scientist of Voice Morphing, a California start-up, and co-CTO of Kextil, engaged in voice-centric interfaces for the field service industry.
- Continuing with legal prior art and expert witness work for various customers in speech recognition and human interfaces, including successful defense against patent infringement in Nuance vs Vlingo in Boston, 2011.

2006-2009 **SRI International**, Menlo Park CA

Title: Senior Scientist

- Principal Investigator for GALE, Global Autonomous Language Exploitation, DARPA program.
- Created new business opportunities, including BALTIC, a virtual institute for language innovation which required negotiations with the staff of the House Armed Services Committee and various representatives.
- Technical Advisor to the STAR laboratory for speech and language processing.
- Advisor to the SRI Commercialization Board on embedded speech systems.
- Created new algorithms for machine translation.

2000 - 2006 **Voice Signal Technology**, Woburn MA

Title: Chief Technology Officer

- Recruited technical members of core technology team.
- Guided speech, language, and user interface technology and business development in cell phones and other mobile devices. Tracked emerging opportunities.
- Presented Voice Signal technology and marketing strategy at conferences and in popular articles.

1999 - 2000 **Dragon Systems**, Newton, MA

Title: Director of Business Relations

- Developed business opportunities in Audio Mining.
- Identified and negotiated government contracts, including \$6M of research from DARPA.

1985 – 1999+ **Institute for Defense Analyses CCR**, Princeton NJ - continuing relationship as adjunct

Title: Member of the Technical Staff

- Developed novel signal processing and speech algorithms.
- Developed cryptanalytic techniques and applications.
- Assisted DARPA in bringing speech technology to use in government applications, including founding Summer Workshops in Speech Recognition (now JHU CLSP summer program in speech and language).
- Chair of Arpa workshop in Spoken Language Technology, Barton Creek, TX.
- Received four special awards for development and application of novel cryptanalytic techniques.

1982 - 1985 **International Business Machines**, Yorktown Heights NH

Title: Member of the Technical Staff

- Developed practical applications for discrete recognition.
- Wrote front end for TANGORA, the IBM Recognizer (auditory model)

1974 - 1982 **National Security Agency**, Fort Meade MD

Title: Research Engineer

- Developed novel statistical processes for signal analysis.
- Created new applications of mathematical search algorithms.
- Certified as Cryptanalytic Mathematician and Engineer.

1970-1974 US **Air Force**, Served at Chanut Air Force Base and at Fort Meade MD and at NSA (from 1971)

Final Rank: Captain

EDUCATION

1975 - 1982	University of Connecticut Storrs, CT	PhD, Linguistics (PhD Dissertation not-in-residence)
1968 - 1970	University of Illinois Urbana, IL	MSEE, Electrical Engineering
1964 - 1968	University of Massachusetts Amherst	BSEE, Electrical Engineering

MEMBERSHIPS

Member, Acoustical Society of America

Member, ISCA
Senior Life Member, IEEE

REFEREED PUBLICATIONS

B. Erol, J Cohen, M Etoh, HW Hon, J Luo, J. Schalkwyk, "Mobile media search," ICASSP, 2009-9, 4897-4900

J. Wilpon, ME Gilbert, J Cohen, "The Business of Speech Technologies," Springer Handbook of Speech Processing, 2008, p. 681-704

H. Hermansky, J.R. Cohen, and R.M. Stern, "Perceptual Properties of Current Speech Recognition Technology," Proceedings of the IEEE, September, 2013, Vol. 101 No. 9, p. 1968

M Gilbert, A Acero, J Cohen, H. Bourlard, SF Chang, M Etoh, "Media Search in Mobile Devices", Signal Processing Magazine, IEEE 28(4), 2011, 12-13

M. Harper, A Acero, S Bangalore, J Carbonell, J. Cohen, B. Cuthill, C. Espy, "Report on the Sponsored Human Language Technology Workshop on Industrial Centers, 2007/6/22, pdf available from umd.edu

Jordan Cohen¹, Terri Kamm², and Andreas G. Andreou, "Vocal tract normalization in speech recognition: Compensating for systematic speaker variability", J. Acoust. Soc. Am. Volume 97, Issue 5, pp. 3246-3247 (1995)

J. Cohen, J Flanagan, "A Welcome to the Special Edition on Robust Speech Recognition, A Summer workshop - 1993", IEEE Trans on Speech and Audio Processing, 2, 4, 551-553.

J. Cohen, "Application of an auditory model to speech recognition", JASA, 85, June 1989

J. Cohen, "Segmenting speech using dynamic programming", JASA, 69, 1980

J. Cohen, T. Crystal, A. House and E. Neuburg, "Weighty voices and shaky evidence", JASA, 68, 1980

Many popular short articles and presentations

More than 20 Classified Publications

Co-author of more than 13 Patents granted

Clearance: TSSI

PATENTS:

13/779,644 February 27, 2013	Methods and apparatus for formant-based voice synthesis Edgington, Michael D.; Gillick, Laurence; Cohen, Jordan
13/755,386 January 31, 2013	Systems and methods for voice-guided operations Berman, Jonathan R.; Cohen, Jordan; Rudnicky, Alexander I.
WO 2,012,135,293 October 5, 2012	Methods and Systems for Searching Utilizing Acoustical Context Goldstein, Steven; Cohen, Jordan, <i>et al.</i>
8,160,884	Methos and apparatus for automatically extending the voice vocabulary of mobile communications devices

- April 17, 2012 Roth, Daniel L.; Cohen, Jordan; Behrakis, Elias P.
- 8,019,324
September 13, 2011 Extendable voice commands
Roth; Daniel L., Reiner; Chris, Furnari; Mark, Cohen; Jordan
- EP 1,774,516
March 16, 2011 Normalization of cepstral features for speech recognition
Zlokarnik, Igor; Gillick, Laurence S.; Cohen, Jordan
- EP 1,751,741
February 14, 2007 Automated Testing of Voice Recognition Software
Cohen, Jordan; Barton, William; Ploumis, John; Ely, Douglas J.
- 7,873,390
January 18, 2011 Provider-activated software for mobile communication devices
Cohen; Jordan, Roth; Daniel L.
- 7,809,574
October 5, 2010 Word recognition using choice lists
Roth; Daniel L., Cohen; Jordan R., Johnston; David F. , Porter; Edward W.
- 7,797,157
September 14, 2010 Automatic speech recognition channel normalization based on measured statistics from initial portions of speech utterances
Zlokarnik; Igor, Gillick; Laurence S., Cohen; Jordan
- 7,716,058
May 11, 2010 Speech recognition using automatic recognition turn off
Roth; Daniel L., Cohen; Jordan R., Johnston; David F.
- 12/644,652
December 22, 2009 Method and apparatus for back-up of customized application information
Gillick, Laurence S.; Cohen, Jordan, *et al.*
- 7,634,403
December 15, 2009 Word recognition using word transformation commands
Roth; Daniel L., Cohen; Jordan R., Johnston; David F.
- 7,577,569
August 18, 2009 Combined speech recognition and text-to-speech generation
Roth; Daniel L., Cohen; Jordan R., Johnston; David F., Grabherr; Manfred G., Porter; Edward W.
- 7,562,019
July 14, 2009 Automated testing of voice recognition software
Cohen; Jordan, Barton; William, Ploumis; John, Ely; Douglas J.
- 7,526,431
April 28, 2009 Speech recognition using ambiguous or phone key spelling and/or filtering
Roth; Daniel L., Cohen; Jordan R., Johnston; David F.
- 7,505,911
March 17, 2009 Combined speech recognition and sound recording
Roth; Daniel L., Cohen; Jordan R., Johnston; David F., Porter; Edward W.
- 7,444,286
October 28, 2008 Speech recognition using re-utterance recognition
Roth; Daniel L., Cohen; Jordan R.
- 7,313,526
December 25, 2007 Speech recognition using selectable recognition modes
Roth; Daniel L., Cohen; Jordan R., Johnston; David F., Grabherr; Manfred G.
- EP 1,844,464
October 17, 2007 Methods and apparatus for automatically extending the voice-recognizer vocabulary of mobile communications devices
Roth, Daniel L.; Cohen, Jordan; Behrakis, Elias P.
- 7,225,130
Methods, systems, and programming for performing speech recognition

May 29, 2007	Roth; Daniel L., Cohen; Jordan R., Johnston; David F., Grabherr; Manfred G.
WO 2,007,033,147 March 23, 2007	Methods and apparatus for formant-based voice synthesis Edgington, Michael; Gillick, Lawrence; Cohen, Jordan, <i>et al.</i>
EP 1,687,961 August 9, 2006	Installing language modules in a mobile communication device Barton, William; Cohen, Jordan; Roth, Daniel L.
WO 2,006,002,308 January 6, 2006	Extendable voice commands Roth, Daniel; Reiner, Chris; Furnari, Mark; Cohen, Jordan, <i>et al.</i>
EP 1,604,350 December 14, 2005	Methods, systems, and programming for performing speech recognition Roth, Daniel L.; Cohen, Jordan; Johnson, David F.; Grabherr, Manfred G.; Franzosa, Paul A.; Porter, Edward W., <i>et al.</i>
DE 112,004,000,187 December 1, 2005	Verfahren und Vorrichtung der prosodischen Simulations-Synthese Cohen, Jordan; Zlokarnik, Igor; Roth, Daniel L.
10/988,994 November 15, 2004	Installing language modules in a mobile communication device Roth, Daniel L.; Cohen, Jordan; Barton, William
11/225,524 September 13, 2005	Methods and apparatus for formant-based voice systems Edgington, Michael D.; Gillick, Laurence; Cohen, Jordan R.
WO 2,005,070,130 August 5, 2005	Speech recognition channel normalization utilizing measured energy values from speech utterance Gillick, Laurence; Cohen, Jordan, <i>et al.</i>
WO 2,005,070,092 August 5, 2005	Automated testing of voice recognition software Cohen, Jordan; Barton, William; Ploumis, John; Ely, Douglas J., <i>et al.</i>
EP 1,559,095 August 3, 2005	Apparatus, methods and programming for speech synthesis via bit manipulations of compressed data base Zlokarnik, Igor; Gillick, Laurence S.; Cohen, Jordan
WO 2,005,050,958 June 3, 2005	Installing language modules in a mobile communication device Roth, Daniel; Cohen, Jordan; Barton, William, <i>et al.</i>
WO 2,005,027,482 March 25, 2005	Text messaging via phrase recognition Roth, Daniel; Cohen, Jordan, <i>et al.</i>
WO 2,005,027,479 March 25, 2005	Phone number and name pronunciation interchange via mobile phone Barton, William; Cohen, Jordan
WO 2,005,027,478 March 25, 2005	Automatic voice addressing and messaging methods and apparatus Roth, Daniel; Gillick, Laurence; Cohen, Jordan; Barton, William, <i>et al.</i>
WO 2,005,027,477 March 25, 2005	Voice enabled phone book interface for speaker dependent name recognition and phone number categorization Funari, Mark; Cohen, Jordan
WO 2,005,027,475 March 25, 2005	Method and apparatus for using audio prompts in mobile communication devices Lazay, Thomas; Cohen, Jordan; Mather, Tracy; Barton, William, <i>et al.</i>

WO 2,005,026,958 March 25, 2005	Method and apparatus for back-up of customized application information Roth, Daniel; Gillick, Laurence; Cohen, Jordan, <i>et al.</i>
WO 2,004,102,527 November 26, 2004	A signal-to-noise mediated speech recognition method Roth, Daniel; Gillick, Laurence; Cohen, Jordan, <i>et al.</i>
10/938,419 September 10, 2004	Automatic voice addressing and messaging methods and apparatus Roth, Daniel L.; Gillick, Laurence S.; Cohen, Jordan; Barton, William
10/937,890 September 9, 2004	Phone number and name pronunciation interchange via cell phone Barton, William; Cohen, Jordan
10/936,882 September 9, 2004	Method and apparatus for back-up of customized application information Roth, Daniel L.; Gillick, Laurence S.; Cohen, Jordan
10/935,691 September 7, 2004	Text messaging via phrase recognition Roth, Daniel L.; Cohen, Jordan
10/935,690 September 7, 2004	Voice enabled phone book interface for speaker dependent name recognition and phone number categorization Funari, Mark; Cohen, Jordan
10/932,341 September 1, 2004	Method and apparatus for using earcons in mobile communication devices Lazay, Thomas; Cohen, Jordan; Zlatkova, Tracy Mather; Barton, William
WO 2,004,068,466 August 13, 2004	Prosodic mimic synthesis method and apparatus Cohen, Jordan; Roth, Daniel; Zlokarnik, Igor, <i>et al.</i>
WO 2,004,054,217 June 25, 2004	Provider-activated software for mobile communication devices Cohen, Jordan; Roth, Daniel, <i>et al.</i>
10/842,333 May 10, 2004	Signal-to-noise mediated speech recognition algorithm Cohen, Jordan; Roth, Daniel L.; Gillick, Laurence S., <i>et al.</i>
WO 2,004,034,377 April 23, 2004	Apparatus, methods and programming for speech synthesis via bit manipulations of compressed data base Cohen, Jordan; Gillick, Laurence S.; Zlokarnik, Igor, <i>et al.</i>
WO 2,004,023,455 March 19, 2004	Methods, systems, and programming for performing speech recognition Roth, Daniel; Cohen, Jordan; Johnson, David; Grabherr, Manfred; Franzosa, Paul; Porter, Edward, <i>et al.</i>
10/657,421 September 8, 2003	Prosodic mimic method and apparatus Cohen, Jordan; Roth, Daniel L.; Zlokarnik, Igor
10/268,612 October 10, 2002	Apparatus, methods, and programming for speech synthesis via bit manipulations of compressed database Cohen, Jordan; Gillick, Laurence S.; Zlokarnik, Igor
09/779,426 February 8, 2001	Feedback for unrecognized speech Roth, Daniel L.; Cohen, Jordan
EP 0,179,280 April 25, 1990	Nonlinear signal processing in a speech recognition system Bakis, Raimo; Cohen, Jordan

SELECTED INFORMAL PRESENTATIONS AND ARTICLES

“Simple Speech Morphing: A Story” presented to the Boston chapter of AVIOS and Brandeis University, October 17, 2013.

“OUCH (Outing Unfortunate Characteristics of HiddenMarkovModels) or What's Wrong with Speech Recognition and What Can We Do About it?”, Johns Hopkins University, Sep 14, 2012 (see <http://www.clsp.jhu.edu/seminars/1335/>)

“Embedded speech recognition applications in mobile phones: Status, trends and challenges”, in Proceedings of the International Conference on Acoustic Speech and Signal Processing 2008, April, 2008, p. 5352 – 5355

“The GALE Project: a description and an update”, in Proceedings of the IEEE Workshop on Automatic Speech Recognition and Understanding, 9-13 December, 2007

“Handheld Multimodal Interfaces Technology, Markets, and Opportunities” Johns Hopkins, Baltimore, 2005

“Is Embedded Speech Recognition Disruptive Technology?” in Information Quarterly, Volume 3, Number 5, 2004, p. 14-17

“Practical Manipulation of Local Data – An Update”, At Wireless Internet Data and Enterprise Applications, UCLA, Los Angeles, CA, September 2003

“Putting Speech Technologies in your Hands”, LangTech 2003, Paris, 24-5 November 2003

“Voice Signal Overview: The Case for Embedded Speech Recognition”, VOX 2002, Kelsey Group, San Francisco, CA (July, 2002)

“Speech recognition in the real world: An Embedded Viewpoint” Center for Language and Speech Processing Workshop at Johns Hopkins, July 26, 2001

“Some musings on systematic variability and speech recognition”, J. Acoust. Soc. Am. Volume 105, Issue 2, pp. 1158-1158 (1999)

“The Challenge of Spoken Language Systems: Research Directions for the Nineties”, Co-author, IEEE Transactions on Speech and Audio Processing, Vol 3, No. 1 1-20 Jan 1995.

“The hub and spoke paradigm for CSR evaluation” (co-author), Proceedings of the 1994 Human Language Technology Workshop, Plainsboro, NJ, March, 1994

“Robust speech processing”, Jordan Cohen, Chair “The Summers of our Discontent”, a talk In Speech and Natural Language: Proceedings of a Workshop Held at Harriman, New York, February 23-26, 1992

“A Pitch measurement algorithm for speech” Acoustics, Speech, and Signal Processing, IEEE International Conference on ICASSP '82

"The Summers of Our Discontent," *Proceedings of the International Conference on Spoken Language Processing*, 1996