

## 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 Cohen<sup>1</sup>, Terri Kamm<sup>2</sup>, 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, <i>et al.</i>
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>

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