

Evandro Gouvêa

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- INTERESTS
- ◇ Voice search
 - ◇ Speech recognition
 - ◇ Natural language processing
- EDUCATION
- ◇ **Ph.D., Electrical and Computer Engineering**
Carnegie Mellon University, USA, 1999
Thesis: *Acoustic-Feature-Based Frequency Warping for Speaker Normalization.*
 - ◇ **M.S., Electrical Engineering**
Universidade de São Paulo, Brazil, 1993
Dissertation: *Speech Synthesis in Portuguese.*
 - ◇ **B.S., Electrical Engineering**
Instituto Tecnológico de Aeronáutica, Brazil, 1990
Thesis: *System Requirements for Secondary Surveillance Radars.*
 - ◇ **Scientific initiation**
Instituto Tecnológico de Aeronáutica, Brazil, 1988
Studies in Mathematics, on *topology, functional analysis, and numerical analysis.*
- EXPERIENCE
- ◇ **European Media Lab (EML), Heidelberg, Germany, July 2011 - present**
Software Developer
 - Optimization of proprietary decoder. Worked on evaluating and optimizing company's decoder.
 - ◇ **Mitsubishi Electric Research Labs (MERL), Cambridge, MA, Jan 2008 - Jun 2010**
Principal Technical Staff
 - Improvement of in-house document retrieval system. Uncovered and fixed long standing issues with term frequency-inverse document frequency (TF-IDF) implementation. Took active part in porting code to different platform. Evaluated different scoring and term weighting methods.
 - Evaluation of effect of speech recognition errors in document retrieval performance. The goal is to optimize the recall rate of MERL's SpokenQuery voice search system as it is affected by the speech recognizer's performance.
 - Evaluation of recognition performance on open source (Sphinx) and commercial speech recognizers. The evaluation goal is to improve on dictionaries and language models used by the decoders using a proprietary audio database.
 - Obtaining particle (sub-word or multi-phone units) sets optimized for document retrieval. Particles used in a document retrieval system may span across words, and do not have to be converted back to a word representation. We developed methods for particlizing sentences achieving higher retrieval performance than using a word-based system.
 - Continued contribution to CMU Sphinx, an open source project.
 - ◇ **Carnegie Mellon University, Pittsburgh, PA, Feb 2002 - Dec 2007**
Research Associate

- Research on better listening capabilities for the Project Listen. Responsibilities included building and evaluation of acoustic models for children's speech; evaluation of task specific metrics; and building tools to improve analysis of collected data.
 - Development of Sphinx-4, a speech recognition system in the Java (TM) programming language, jointly with Sun Microsystems, Inc., and Mitsubishi Electric Research Labs. Responsibilities included providing speech recognition expertise to Sun's software engineers; and designing and implementing components of the system.
 - Maintenance of CMU Sphinx, an open source project. Responsibilities included releases, bug fixes, web page maintenance, and project administration at the site sourceforge.net, using CVS and SVN.
 - Wrote a tutorial about how to use the CMU Sphinx speech recognition system.
 - Made available several resources used by the whole speech processing community, including the AN4 database (alpha numeric), acoustic models in English, Spanish, and French.
 - Maintenance of local linux computer cluster, which included keeping up the PBS (Portable Batch System) queuing mechanism, for resource allocation.
- ◇ **Vocollect, Inc., Pittsburgh, PA, Jan 1999 - July 2001**
Research Scientist
- Development of a Hidden Markov Model-based speech recognition system. Usage requirements included noisy environments, language independence, small amount of training data, and hardware limitations, running on an embedded system with limited speed and memory.
 - Responsibilities included full development of the acoustic model trainer; revamping the front end, converting from imelda coefficients to cepstra and adding a vector quantization (VQ) stage; design and collection of audio databases to test and benchmark speech recognition performance.
- ◇ **Carnegie Mellon University, Pittsburgh, PA, Jan 1994 - Dec 1998**
Research Assistant
- Designed, implemented, and evaluated algorithms for speaker normalization. Participated in several ARPA-sponsored speech recognition systems evaluations, including Hub 3 and Hub 4.
- ◇ **Carnegie Mellon University, Pittsburgh, PA, Fall 1996**
Teaching Assistant
- T.A. for Digital Signal Processing class of 30 students.

COMPUTER
SKILLS

- ◇ **Operating systems:** Unix/Linux, Mac OSX, Windows.
- ◇ **System administration:** PBS, Torque, Maui, TWiki.
- ◇ **Languages:** Python, C, Java, JNI, Perl, Unix/Linux Shell (bash, tcsh, csh), MySQL.
- ◇ **Version control:** Subversion, CVS, MS SourceSafe.
- ◇ **Compilers and IDE:** ant, gcc, Eclipse, Microsoft Visual Studio.
- ◇ **Productivity Tools:** Matlab, L^AT_EX, Emacs, Microsoft Office (Excel, PowerPoint, Word).

PUBLISHED
RESEARCH

- ◇ **Gouvêa, E.**, "Hybrid Speech Recognition for Voice Search: a Comparative Study", *Proceedings of the 12th. Annual Conference of the International Speech Communication Association*, Florence, 2011.
- ◇ **Gouvêa, E.**, Davel, M. H., "Kullback-Leibler divergence-based ASR training data selection", *Proceedings of the 12th. Annual Conference of the International Speech Communication Association*, Florence, 2011.

- ◇ Reddy, S., **Gouvêa, E.**, “Learning from Mistakes: Expanding Pronunciation Lexicons using Word Recognition Errors”, *Proceedings of the 12th. Annual Conference of the International Speech Communication Association*, Florence, 2011.
 - ◇ **Gouvêa, E.B.**, Ezzat, T., “Vocabulary Independent Spoken Query: a Case for Subword Units”, *Proceedings of the 11th. Annual Conference of the International Speech Communication Association*, Tokyo, 2010.
 - ◇ **Gouvêa, E.B.**, Ezzat, T., Raj, B., “Subword Unit Approaches For Retrieval By Voice”, *SpokenQuery 2010 Workshop on Voice Search*, Dallas, 2010.
 - ◇ **Gouvêa, E.B.**, Raj, B., “Word Particles Applied to Information Retrieval”, *European Conference on Information Retrieval*, Toulouse, 2009.
 - ◇ Stern, R.M., **Gouvêa, E.B.**, Kim, C., Kumar, K., Park, H.-M., “Binaural and Multiple-Microphone Signal Processing Motivated by Auditory Perception”, *HSCMA Joint Workshop on Hands-free Speech Communication and Microphone Arrays*, Trento, 2008.
 - ◇ Singh, R., **Gouvêa, E.B.**, Raj, B., “Probabilistic Deduction of Symbol Mappings for Extension of Lexicons”, *Proc. Interspeech*, Antwerp, 2007.
 - ◇ Stern, R.M., **Gouvêa, E.B.**, Thattai, G., “Polyaural Array Processing for Automatic Speech Recognition in Degraded Environments”, *Proc. Interspeech*, Antwerp, 2007.
 - ◇ Mostow, J., Beck, J., Cen, H., Cuneo, A., **Gouvêa, E.**, Heiner, C., “An Educational Data Mining Tool to Browse Tutor-Student Interactions: Time Will Tell!”, *Proc. Workshop on Educational Data Mining*, Pittsburgh, 2005.
 - ◇ Mostow, J., Beck, J., Cuneo, A., **Gouvêa, E.**, Heiner, C., “A Generic Tool to Browse Tutor-Student Interactions: Time Will Tell!”, *Proc. AIED*, Amsterdam, 2005.
 - ◇ Lamere, P., Kwok, P., Walker, W., **Gouvêa, E.**, Singh, R. Raj, B., Wolf, P., “Design of the CMU Sphinx-4 decoder”, *Proc. Eurospeech*, Genebra, 2003.
 - ◇ **Gouvêa, E.B.**, “Acoustic-Feature-Based Frequency Warping for Speaker Normalization”, Ph.D. Thesis, Carnegie Mellon University, Pittsburgh, 1999.
 - ◇ **Gouvêa, E.B.**, Stern, R.M., “Speaker Normalization Through Formant-Based Warping of the Frequency Scale”, *Proc. Eurospeech*, Rhodes, 1997.
 - ◇ Raj, B., **Gouvêa, E.B.**, Stern, R.M., “Vector Polynomial Approximations for Robust Speech Recognition”, *Proc. ETRW*, Pont-a-Mousson, 1997.
 - ◇ Campos, G.L., **Gouvêa, E.B.**, “Speech Synthesis using the CELP Algorithm”, *Proc. ICSLP*, Philadelphia, 1996.
 - ◇ Raj, B., **Gouvêa, E.B.**, Stern, R.M., “Cepstral Compensation by Polynomial Approximation for Environment-Independent Speech Recognition”, *Proc. ICSLP*, Philadelphia, 1996.
 - ◇ **Gouvêa, E.B.**, Moreno, P.J., Raj, B., Sullivan, T.M., Stern, R.M., “Adaptation and Compensation: Approaches to Microphone and Speaker Independence in Automatic Speech Recognition”, *Proc. DARPA Speech Recognition Workshop*, Harriman, 1996.
 - ◇ Jain, U., Siegler, M.A., Doh, S.-J., **Gouvêa, E.B.**, Moreno, P.J., Raj, B., Stern, R.M., “Recognition of Continuous Broadcast News With Multiple Unknown Speakers And Environments”, *Proc. DARPA Speech Recognition Workshop*, Harriman, 1996.
 - ◇ Moreno, P.J., Raj, B., **Gouvêa, E.B.**, Stern, R.M., “Multivariate-Gaussian-Based Cepstral Normalization for Robust Speech Recognition”, *Proc. ICASSP*, Detroit, 1995.
 - ◇ **Gouvêa, E.B.**, “Speech Synthesis in Portuguese”, Master’s Thesis, Universidade de São Paulo, São Paulo, 1993.
- PATENTS ◇ Method for Retrieving Items Represented by Particles from an Information Database, US Pat. 12495540, Applied June 2009.

- ◇ Method for Determining Distributions of Unobserved Classes of a Classifier, Applied April 2009.
 - ◇ Method for Indexing for Retrieving Documents Using Particles, US Pat 12036681, Applied Feb 2008.
- ACTIVITIES
- ◇ Co-organizer of the SpokenQuery 2010 Workshop on Voice Search.
 - ◇ Co-organizer of the CMU Sphinx Users and Developers Workshop 2010.
 - ◇ Internship mentor for S. Reddy, Summer 2009.
 - ◇ Co-organizer of the 1990 Graduating Class Commencement Ceremony.
- TECHNICAL REVIEWER
- ◇ Panel Reviewer for the U.S. Government's National Science Foundation (NSF).
 - ◇ Book Reviewer for Elsevier Publishing Company.
 - ◇ Book Reviewer for Springer International Publisher.
 - ◇ Reviewer for IEEE Transactions on Audio, Speech, and Language Processing.
 - ◇ Reviewer for Computers in Biology and Medicine.
 - ◇ Reviewer for ICASSP 2011 – 2008.
 - ◇ Reviewer for InterSpeech 2011 – 2008.
 - ◇ Reviewer for ASRU 2009 – 2005.
 - ◇ Reviewer for SAPA 2008 – 2004.
 - ◇ Reviewer for ICMI 2009 – 2008.
- AWARDS
- ◇ MERL President's Award, in recognition of contributions to Voice Interface Support and SpokenQuery in Car Navigation, 2008.
 - ◇ Scholarship for the Ph.D. program by CNPq (Brazilian funding agency), January 1994 - July 1998.
 - ◇ Scholarship for the M.S. program by FAPESP (Brazilian funding agency), August 1992 - December 1993.
 - ◇ Scholarship for scientific initiation by CNPq, March 1986 - December 1988.
 - ◇ Participation in the XXII International Mathematics Olympiad, Poland, 1986.
 - ◇ First Prize in the VIII Brazilian Mathematics Olympiad, 1985.
 - ◇ Fifth Prize in the I Physics Olympiad of the State of São Paulo, 1985.
 - ◇ Third Prize in the VI Mathematics Olympiad of the State of São Paulo, 1982.
 - ◇ First Prize in the IV Mathematics Olympiad of the State of São Paulo, 1980.
- LANGUAGES
- ◇ Native: Portuguese.
 - ◇ Fluent: English, Spanish.
 - ◇ Other: French (currently in intermediate level), German (Goethe Institut's *Zertifikat Deutsch als Fremdsprache*), and Italian.
- EXTRA CURRICULAR
- ◇ Co-hosted the "Brazilian Radio Hour" on WRCT-FM, 1999 to 2007.
 - ◇ Co-produced video presentation for event celebrating Brazil's 500 years.
- REFERENCE
- Available upon request