Carolina Parada

CONTACT INFORMATION

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RESEARCH INTERESTS

Automatic speech recognition (ASR), natural language processing (NLP), machine learning, language modeling, out-of-vocabulary detection in speech, spoken term detection.

EDUCATION

PhD Candidate in Electrical Engineering

Johns Hopkins University, Baltimore, MD
Advisor: Frederick Jelinek 2006 - 2010 (deceased)
Expected graduation date: May 2011

Master of Science in Electrical Engineering, July 2006

Washington State University, Pullman, WA
Thesis: A collection of observations on data-rate limited control

Bachelor of Science in Electrical Engineering, December 2004

Washington State University, Pullman, WA

EMPLOYMENT

Johns Hopkins University, Baltimore, MD. September 2006 - Present
Center for Language and Speech Processing and Human Language Technology COE
Thesis advisor: Frederick Jelinek 2006 - 2010 (deceased).
Current advisors: Hynek Hermansky (ECE) and Mark Dredze (CS).

- Presented an unsupervised technique to learn optimal sub-word representations for open vocabulary speech recognition using a log-linear model.
- Presented a novel approach for detecting out-of-vocabulary regions in the LVCSR output. Our method jointly predicts the error regions and incorporates contextual information, achieving substantial gains.
- Introduced a spoken term detection framework to recover the orthographic representation of unseen words using the World Wide Web as a corpus.
- OOV-sensitive named entity recognition in speech: we identify regions of speech containing named entities, even if incorrectly transcribed. Our approach improved detection of in-vocabulary and out-of-vocabulary named-entities in speech.
- Improved spoken term detection performance for textual and acoustic queries containing out-of-vocabulary terms.
- Developed an online game in which humans re-score transcription lattices to correct ASR errors. The goal is to learn more about the human language model performance.

IBM Speech Research Group, Yorktown Heights, NY. Summer 2009
Summer Intern

- Presented a novel weighted finite-state transducer (WFST)-based approach for query-by-example spoken term detection (acoustic queries).
- Improved spoken term detection performance for textual out-of-vocabulary queries. Our approach incorporates contextual information, phonetic confusability, and confidence estimation.
- Worked with: Abhinav Sethy and Bhuvana Ramabhadran.

Google Speech Research Group, New York, NY. Summer 2008
Summer Intern

- Introduced a novel technique for automatically segmenting compounded text using large statistical language models (patented).
- Investigated hierarchical language models for automatic speech recognition.
- Worked with: Boulos Harb and Johan Schalkwyk.

Nuance Inc. Research Group, Burlington MA. Summer 2007
Summer Intern

- Implemented Viterbi forced-realignment in the speaker adaptation modules. Code re-factoring.
- Worked with: Puming Zhan.

Honors/Awards

U.S./Canada Google PhD Fellowship in Speech 2010
Human Language Technology Center of Excellence RA 2008 - 2010
Dean's fellowship, Johns Hopkins University 2006 - 2010
International Merit Award, Washington State University 2003 - 2004

Professional Skills

- Strong programming skills: C/C++ , Java, Perl, Python, shell
- Tools: OpenFst, AT&T FSM toolkit, SRILM, Mallet, Matlab.
- Training: IBM's speech recognition system Attila and BBN's system Byblos.
- Bilingual (English, Spanish).

Publications

Carolina Parada, Mark Dredze, Abhinav Sethy, and Ariya Rastrow, "Learning Sub-Word Units for Open Vocabulary Speech Recognition," (submitted to) ACL, 2011.

Carolina Parada, Mark Dredze, and Frederick Jelinek, "OOV Sensitive Named Entity Recognition in Speech," (submitted to) Icassp, 2011.

Ciprian Chelba, Johan Schalkwyk, Thorsten Brants, Vida Ha, Boulos Harb, Will Neveitt, **Carolina Parada**, and Peng Xu, "Query Language Modeling for Voice Search," in Proc. IEEE-SLT, 2010.

Carolina Parada, Abhinav Sethy, Mark Dredze, and Frederick Jelinek, "A Spoken Term Detection Framework for Recovering Out-of-Vocabulary Words Using the Web," in Proc. Interspeech, 2010.

Carolina Parada, Mark Dredze, Denis Filimonov, and Frederick Jelinek, "Contextual Information Improves OOV detection in Speech," in Proc. NAACL, 2010.

Carolina Parada, Abhinav Sethy, and Bhuvana Ramabhadran, "Balancing False Alarms and Hits in Spoken Term Detection," in Proc. ICASSP, 2010.

Carolina Parada, Abhinav Sethy, and Bhuvana Ramabhadran, "Query-by-Example Spoken Term Detection for OOV terms," in Proc. ASRU, 2009.

Carolina Parada. "A Collection of Observations on Data-Rate-Limited Control," Thesis (M.S.) Washington State University, 2006.

Patents

Compounded Text Segmentation. GP-1910-00-US, 16113-1503001.

Professional Activities and Service

Reviewer for ICASSP 2011
Member, Institute of Electrical and Electronics Engineers, Inc.
Member, Association for Computational Linguistics (ACL)