

Brian D. Langner (*blangner@cs.cmu.edu*)

CONTACT INFORMATION

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RESEARCH INTERESTS

Natural language generation, speech synthesis, spoken dialog systems, natural language processing, speech-to-speech translation, speech recognition, computational linguistics, human-computer interaction, artificial intelligence, cognitive science

EDUCATION

Carnegie Mellon University

Ph.D. in Language and Information Technologies, May 2010

Dissertation: "Data-driven Natural Language Generation: Making Machines Talk Like Humans Using Natural Corpora"

M.S. in Language Technologies, May 2004

Michigan State University

B.S. with Honors in Computer Science, May 2002

Cognate in Cognitive Science

CURRENT RESEARCH

- Audio and speech analysis for event detection in consumer-grade video
- Data-driven natural language generation
- Tactical spoken language generation
- Spoken dialog systems
- Intelligent presentation of complex information using speech synthesis
- Understandable and human-like spoken natural language generation for the general population

ACADEMIC AND TEACHING EXPERIENCE

Carnegie Mellon University, Pittsburgh, PA

Postdoctoral Researcher

March 2011 - October 2011

Researcher in the speech and audio group for a multimedia event detection and recounting project. Research focus in acoustic scene analysis (automatic semantic class transcription of non-speech audio) and event recounting (automatic generation of natural language video descriptions and explanations of detection decisions).

Undergraduate Supervisor

Fall 2008, Spring 2009, Spring 2011

Supervised undergraduate students working on various research projects. Projects included: investigating features of dialog success and failure for the purpose of estimating whether a particular dialog will be successful while the dialog is occurring; using speaker ID technology to determine dialog user identity across multiple calls and examining differences between frequent and infrequent callers.

Course Lecturer

August 2008 - December 2009

Part-time lecturer for several undergraduate and graduate level courses, including Speech Processing, covering a practical and theoretical understanding of speech recognition, speech synthesis, and spoken dialog systems; Speech II, covering perception and prosody of human speech, and speech synthesis.

Conference Tutorial Organizer

June 2008

Co-designed materials and presentation for a tutorial on building practical dialog systems. One of several presenters (about 40% of the session) for a well-attended tutorial session at ACL 2008. This tutorial has now been given several times.

Teaching Assistant

August 2006 - May 2008

Assistant for multiple courses during this time: Introduction to Human Language Technologies, covering information retrieval, NLP, machine translation, and speech recognition and synthesis; Speech II, covering perception and prosody of human speech, and speech synthesis. Duties included assignment grading, course website maintenance, and teaching several lectures.

Michigan State University, East Lansing, MI

Teaching Assistant and Lecturer

August 2000 - May 2002

Assistant for introductory programming course. Duties included being the primary instructor for one or more 2-hour lab sessions per week, grading of weekly programming projects, weekly office hours. In Fall 2001, was the instructor for the Honors section of this course, with additional responsibilities of sole lecturer for the Honors material, including the design, planning, and grading of lectures and assignments.

PROFESSIONAL
SERVICE
ACTIVITIES

Interspeech 2006 Organizing Committee, Webmaster

Designed, expanded, and maintained interfaces to organize and run the large (1300-person) annual speech- and language-oriented international conference. Dealt with paper submission, reviewing, acceptance notifications, session planning and organization, scheduling, and related tasks. Web-based interface was primarily standard HTML and PHP, integrating with a PostgreSQL database for dynamic content.

Technical Committee or Reviewer

- Computers & Education Journal
- Interspeech 2011
- NAACL-HLT 2009 Student Research Workshop

INDUSTRY AND
PROFESSIONAL
EXPERIENCE

Dialog Research Center, Pittsburgh, PA

Researcher and Support Programmer

February 2010 - July 2010

Primary support for spoken dialog research conducted at the Dialog Research Center (DialRC). Responsibilities included software and hardware maintenance tasks, system enhancements and improvements, software and data distribution, and community technical support. Provided additional support and development of the Olympus spoken dialog framework and flite speech synthesis system used by DialRC.

Follett Software Company, McHenry, IL

Software developer

May 2001 - August 2001

Assisted in porting and testing the "WebCollection Plus" product from a C++-based Win32 service/application with a custom embedded language (similar to PHP) to a package of Java servlets and C++-based library code to run under Novell Netware.

3Com Corporation, Mt. Prospect, IL

Web developer

May 2000 - August 2000

Designed and implemented group intranet web site, including use of HTML, Cascading Style Sheets, server-side includes, JavaScript, and Perl-based CGI scripts for dynamic pages. CGI script-controlled creation, modification, and display of developers' test plans and reports.

SOFTWARE
DEVELOPMENT

- Co-developer of **Olympus**, a general open-source framework for building spoken dialog systems. The Olympus platform has been used to build more than a dozen dialog systems at multiple institutions.
- Co-developer of **Let's Go**, a spoken dialog system that provides bus schedule information for the Pittsburgh metropolitan area. This system is accessible to the general public and has handled approximately 100,000 calls between 2005 and 2010.
- Developer on the **flite** speech synthesizer project, a small, fast run-time synthesis engine for multiple architectures designed as an alternative to the Festival engine, capable of using voices built with the FestVox voice-building tools.

PUBLICATIONS

Fandrianto, A., Langner, B., and Black, A. (2011) *Using Speaker ID to Discover Repeat Callers to a Spoken Dialog System*, Interspeech 2011, Florence, Italy.

Black, A., Burger, S., Langner, B., Parent, G., Eskenazi, M. (2010) *Spoken Dialog Challenge 2010*, SLT 2010, Berkeley, USA.

Langner, B., Vogel, S., Black, A. (2010) *Evaluating a Dialog Language Generation System: Comparing the MOUNTAIN System to Other NLG Approaches*, Interspeech 2010, Makuhari, Japan.

Anumanchipalli, G., Muthukumar, P., Nallasamy, U., Parlikar, A., Black, A., Langner, B. (2010) *Improving Speech Synthesis for Noisy Environments*, 7th ISCA Speech Synthesis Workshop, Kyoto, Japan.

Langner, B. (2010) *Data-Driven Natural Language Generation: Making Machines Talk Like Humans Using Natural Corpora*, PhD Thesis, Carnegie Mellon University, Language Technologies Institute, Report CMU-LTI-10-007.

Langner, B., Black, A. (2009) *MOUNTAIN: A Translation-based Approach to Natural Language Generation for Dialog Systems*, IWSDS 2009, Irsee, Germany.

Black, A., Anumanchipalli, G., Kominek, J., Langner, B., Nallasamy, U., Prahallad, K., Qin, L., Toth, A. (2009) *CMU Blizzard 2009: A Statistical Parametric Synthesis Approach*, Blizzard Challenge 2009, Edinburgh, UK.

Eskenazi, M., Black, A., Raux, A., Langner, B. (2008) *Let's Go Lab: A platform for evaluation of spoken dialog systems with real world users*, Interspeech 2008, Brisbane, Australia.

Black, A., Bennett, C., Kominek, J., Langner, B., Prahallad, K., Toth, A. (2008) *CMU Blizzard 2008: Optimally Using a Large Database for Unit Selection Synthesis*, Blizzard Challenge 2008, Brisbane, Australia.

Raux, A., Langner, B., Black, A., Eskenazi, M. (2008) *Tutorial: Building Practical Spoken Dialog Systems*, ACL/HLT 2008, Columbus, USA.

Langner, B., Black, A. (2007) *uGloss: A Framework for Improving Spoken Language Generation Understandability*, Interspeech 2007, Antwerp, Belgium.

Black, A., Bennett, C., Blanchard, B., Kominek, J., Langner, B., Prahallad, K., Toth, A. (2007) *CMU Blizzard 2007: A Hybrid Acoustic Unit Selection System from Statistically Predicted Parameters*, Blizzard Challenge 2007, Bonn, Germany.

Langner, B., Black, A. (2007) *Understandable Production of Massive Synthesis*, 6th ISCA Speech Synthesis Workshop, Bonn, Germany.

Bohus, D., Langner, B., Raux, A., Black, A., Eskenazi, M., Rudnicky, A. (2006) *Online Supervised Learning of Non-understanding Recovery Policies*, SLT 2006, Aruba, Aruba.

Langner, B., Kumar, R., Chan, A., Gu, L., Black, A. (2006) *Generating Time-Constrained Audio Presentations of Structured Information*, Interspeech 2006, Pittsburgh, USA.

Raux, A., Bohus, D., Langner, B., Black, A., Eskenazi, M. (2006) *Doing Research on a Deployed Spoken Dialogue System: One Year of Let's Go! Experience*, Interspeech 2006, Pittsburgh, USA.

Langner, B., Black, A. (2005) *Using Speech In Noise to Improve Understandability for Elderly Listeners*, ASRU 2005, San Juan, Puerto Rico.

Raux, A., Langner, B., Black, A., Eskenazi, M. (2005) *Let's Go Public! Taking a Spoken Dialog System to the Real World*, Interspeech 2005 (Eurospeech), Lisbon, Portugal.

Kominek, J., Bennett, C., Langner, B., Toth, A. (2005) *The Blizzard Challenge 2005 CMU Entry: A Method For Improving Speech Synthesis Systems*, Interspeech 2005 (Eurospeech), Lisbon, Portugal.

Langner, B., Black, A. (2005) *Improving the Understandability of Speech Synthesis by Modeling Speech In Noise*, ICASSP 2005, Philadelphia, USA.

Langner, B., Black, A. (2004) *An Examination of Speech In Noise and Its Effect on Understandability for Natural and Synthetic Speech*, Carnegie Mellon University, Language Technologies Institute, Technical Report CMU-LTI-04-187.

Langner, B., Black, A. (2004) *Creating a Database of Speech In Noise For Unit Selection Synthesis*, 5th ISCA Speech Synthesis Workshop, Pittsburgh, USA.

Raux, A., Langner, B., Black, A., Eskenazi, M. (2003) *LET'S GO: Improving Spoken Dialog Systems for the Elderly and Non-natives*, Eurospeech 2003, Geneva, Switzerland.

AWARDS AND HONORS

- Interspeech 2010 Best Student Paper Award Finalist
- 2005-06 NSF IGERT Fellowship Recipient
- Tau Beta Pi Honor Society
- Upsilon Pi Epsilon Honor Society