Kristy Hollingshead

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Interests

Natural language processing: machine translation, parsing & syntax; machine learning; probabilistic modeling; assistive technologies, alternative communication technologies

Education

Ph.D., Computer Science Engineering: Oregon Health & Science University, 2010
Thesis: *Formalizing the Use and Characteristics of Constraints in Pipeline Systems*
Committee: Brian Roark (chair), Peter Heeman, Deniz Erdogmus, Mark Johnson

M.S., Computer Science Engineering: Oregon Health & Science University, 2004
Concentration: Spoken Language Systems

B.A., English–Creative Writing: University of Colorado at Boulder, 2000

Publications

Nathan Bodenstab, Kristy Hollingshead, and Brian Roark. 2011. Unary constraints for context-free parsing. To appear in *Proceedings of the 49th Annual Meeting of the Association for Computational Linguistics (ACL)*, Portland OR, USA.

Kristy Hollingshead. 2010. Formalizing the use and characteristics of constraints in pipeline systems. PhD thesis, Oregon Health & Science University.

Ting Qian, Kristy Hollingshead, Su-youn Yoon, Kyoung-young Kim, and Richard Sproat. 2010. A Python toolkit for universal transliteration. In *Proceedings of the International Conference on Language Resources and Evaluation (LREC)*, Valletta, Malta.

Christian Monson, Kristy Hollingshead, and Brian Roark. 2010. Simulating morphological analyzers with stochastic taggers for confidence estimation. In *Multilingual Information Access Evaluation, Vol. I, 10th Workshop of the Cross-Language Evaluation Forum (CLEF 2009), Revised Selected Papers.* Lecture Notes in Computer Science, Springer.

Brian Roark and Kristy Hollingshead. 2009. Linear complexity context-free parsing pipelines via chart constraints. In *Proceedings of the Human Language Technology Conference of the N.American Chapter of the Association for Computational Linguistics (HLT-NAACL)*, pages 647-655, Boulder CO, USA.

Brian Roark and Kristy Hollingshead. 2008. Classifying chart cells for quadratic complexity context-free inference. In *Proceedings of the 22nd International Conference on Computational Linguistics (COLING)*, pages 745-752, Manchester, UK.

Kristy Hollingshead and Brian Roark. 2008. Reranking with baseline system scores and ranks as features. Technical Report CSLU-08-001, CSLU, OHSU.

Fan Yang, Peter A. Heeman, Kristy Hollingshead, and Susan E. Strayer. 2008. DialogueView: Annotating dialogues in multiple views with abstraction. In *Natural Language Engineering*, 14(1), pages 3-32.

Kristy Hollingshead and Brian Roark. 2007. Pipeline Iteration. In *Proceedings of the 45th Annual Meeting of the Association for Computational Linguistics (ACL)*, pages 952-959, Prague, Czech Republic.

Brian Roark, Margaret Mitchell, and Kristy Hollingshead. 2007. Syntactic complexity measures for detecting Mild Cognitive Impairment. In *Proceedings of the ACL 2007 Workshop on Biomedical Natural Language Processing (BioNLP)*, pages 1-8, Prague, Czech Republic.

Kristy Hollingshead, Seeger Fisher, and Brian Roark. 2005. Comparing and combining finite-state and context-free parsers. In *Proceedings of the Human Language Technology Conference and Conference on Empirical Methods in Natural Language Processing (HLT/EMNLP)*, pages 787-794, Vancouver BC.

Fan Yang, Peter A. Heeman, and Kristy Hollingshead. 2004. Towards understanding mixed-initiative in task-oriented dialogues. In *Proceedings of the 8th International Conference on Spoken Language Processing (ICSLP - INTERSPEECH 2004)*, pages 217-220, Jeju Island, Korea.

Kristy Hollingshead and Peter A. Heeman. 2004. Using a uniform-weight grammar to model disfluencies in stuttered read speech: a pilot study. Technical Report CSLU-04-002, CSLU, OGI-OHSU.

Research Experience

Post-doctoral Research Associate, 9/11-present
CLIP lab, University of Maryland Institute for Advanced Computer Studies
College Park, MD

- Train and test various machine translation systems, including (1) Arabic-English translation for the DARPA GALE program; and (2) Haitian-English SMS translation as part of the featured translation task at the annual statistical machine translation workshop.
- Collaborating with the Center of Excellence at Johns Hopkins on a project to apply my work on complexity reduction in parsing to machine translation.
- Continuing collaboration with the Oregon Health & Science University to continue my work in parsing.

Graduate Research Assistant, 9/03-8/11
Center for Spoken Language Understanding, Oregon Health & Science University
Beaverton, OR

- Researched pipeline systems, wherein data is processed by a sequence of stages such that the output from one stage provides the input to the next. Projects included: (1) Reducing complexity of context-free parsing with high-precision finite-state constraints; (2) Improving upon state-of-the-art parsing accuracy with novel pipeline iteration technique; (3) Detecting cognitive impairment with syntactic complexity calculations; (4) Improving assistive technology for "locked-in" patients with language modeling techniques.
- Developed a finite-state parser which performs competitively on several shallow parsing tasks. Discovered and corrected several flaws in shallow parsing evaluation metrics. Achieved new state-of-the-art levels of accuracy on several shallow parsing tasks.
- Developed dynamic grammar-based language models to automatically detect and diagnose stuttering events in speech samples.

Visiting Student/Summer Workshop Participant, 6/08-8/08
Center for Language and Speech Processing, Johns Hopkins University
Baltimore, MD

- Participated in the 'Multilingual Spoken Term Detection: Finding and Testing New Pronunciations' workshop team, led by Richard Sproat.
- Extracted transliteration candidates from comparable corpora (English, Chinese, and Arabic Gigaword corpora). Used the IBM/Google Hadoop cloud cluster to calculate temporal correlations for each possible transliteration pair. Analyzed performance using mean-reciprocal rank and accuracy rates.

Research Assistant, 4/03-9/03
Center for Spoken Language Understanding, Oregon Health & Science University
Beaverton, OR

- Examined the underlying structure of human-human dialogues and the roles of different speech acts within a dialogue. Conducted a pilot study to analyze the use of 'okay' as a method of control in dialogues.

Research Assistant, 11/02-3/03
Center for Human-Computer Communication, Oregon Health & Science University
Beaverton, OR

- Collected subject data on how users adapted to computer systems in changing environments. Scored subject videos for speech and gesture integration timing and for cognitive load cues. Presented results regarding users' perception of errors when interacting with the system.

Teaching Experience

Guest Lecturer: Computational Linguistics II, Professor Philip Resnik
"Advanced Topics: Parsing and Psychological Plausibility," 3/11
"Machine Translation and Word-Alignment Models," 4/11

Instructor: Natural Language Processing, assisted by Professor Brian Roark
Winter Quarter, 1/10-3/10

Guest Lecturer: Computational Linguistics, Professor Richard Sproat
"Unix Scripting Tutorial," 9/09

Guest Lecturer: Natural Language Processing, Professor Brian Roark
"Syntax in Machine Translation," 12/08
"Text Processing & Data Structures for NLP," 10/08, 1/07, 1/06

Lab Session Instructor: JHU Summer School on Human Language Technology
"Pronunciation Modeling Using FSTs," 6/08

Guest Lecturer: Text-Based Language Processing Systems, Professor Brian Roark
"Introduction to Machine Translation," 4/08
"Topics in Machine Translation," 5/08

Guest Lecturer: Biological and Linguistic Sequence Analysis, Professor Brian Roark
"Introduction to Dynamic Programming & Approximate Matching," 4/07

Guest Lecturer: Artificial Intelligence, Professor Peter Heeman
"Tutorial on Tcl Programming for AI," 10/03

Work Experience

Technical Editor, 7/00-11/02
IBM — Boulder, CO

OCR Editor, Folio Editor, 10/99-7/00
netLibrary.com — Boulder, CO

Wizard Development Intern, 5/99-8/99
Rela, Inc. — Boulder, CO

Professional Activities & Affiliations

Reviewer for EMNLP: 2009, 2010, 2011

Reviewer for IJCAI 2011

Reviewer for COLING 2010

Reviewer for HLT-NAACL: 2006, 2009, 2010

Reviewer for the ACL Student Workshop 2006

Member of Association for Computational Linguistics (ACL): 2006-present

Fellowships & Awards

National Science Foundation Graduate Research Fellowship, 2004-2007

NAACL/JHU Human Language Technology Scholarship, 2004

Dolf Dolson Award for best entering master's student in computer science, 2003

References

Available upon request.