

# Joanna Drummond

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## Education

PhD Computer Science, University of Toronto, (expected) Spring 2017.

*Co-advisors:* Allan Borodin, Kate Larson

*Achieved Candidacy:* Spring 2015

*Relevant Courses:* Algorithms for Solving Propositional Theories; Intro to Graph Theory; Topics in Knowledge Representation and Reasoning; Advanced Microeconomic Theory I

*GPA:* 3.83

M.S. Computer Science, University of Toronto, Spring 2013.

*Advisor:* Craig Boutilier

*Relevant Courses:* Decision Making under Uncertainty; Advanced Inference Algorithms; Algorithm Design, Analysis, and Theory

*GPA:* 3.93

B.S. Computer Science and Mathematics, University of Pittsburgh, December 2010.

*Research Advisor:* Diane Litman

*Minor:* Theatre Arts.

*Honors:* Graduated Magna Cum Laude with Departmental Honors; Dean's List, Fall 2006 to Spring 2010; Dean's Stars List, Spring 2007; Upsilon Pi Epsilon, Member

*Relevant Courses:* Human Language Technologies; Intro to Artificial Intelligence; Advanced Topics in Artificial Intelligence: Speech and Natural Language Processing for Educational Applications (*Graduate Course*); Algorithm Design; Machine Learning (*Graduate Course*); Intro to Theory of Computation

*GPA:* 3.73

## Publications

*Strategy-Proofness in the Stable Matching Problem with Couples*, Perrault, A., **Drummond, J.**, Bacchus, F., Proc. of the Fifteenth International Conference on Autonomous Agents and Multiagent Systems (AAMAS 2016), pages 132–140.

*SAT is an Effective and Complete Method for Solving Stable Matching Problems with Couples*, **Drummond, J.**, Perrault, A., and Bacchus, F., Proc. of the Twenty-fourth International Joint Conference on Artificial Intelligence (IJCAI-15).

*Preference Elicitation and Interview Minimization in Stable Matchings*, **Drummond, J.** and Boutilier, C., Proc. of the Twenty-eighth Conference on Artificial Intelligence (AAAI-14), pages 645–653.

*Elicitation and Approximately Stable Matching with Partial Preferences*, **Drummond, J.**, and Boutilier, C., Proc. of the Twenty-third International Joint Conference on Artificial Intelligence (IJCAI-13), pages 97–105.

*Intrinsic and Extrinsic Evaluation of an Automatic User Disengagement Detector for an Uncertainty-Adaptive Spoken Dialogue System*, Forbes-Riley, K., Litman, D., Friedberg, H., and **Drummond, J.**, Proc. of the 2012 Conference of the North American Chapter of the Association for Computational Linguistics (NAACL 2012).

*Examining the Impacts of Dialogue Content and System Automation on Affect Models in a Spoken Tutorial Dialogue System*, **Drummond, J.**, and Litman, D., Proc. of the Special Interest Group on Discourse and Dialogue (SIGDIAL) 2011 conference, pages 312–318.

*A State Transition Model for Student Online Discussions*, Seo, S.W., Kang, J.H, **Drummond, J.**, and Kim, J., Proc. of the 17th Conference on Knowledge Discover and Data Mining (AMC SIGKDD 2011) Workshop on Knowledge Discovery in Educational Data.

*Using Graphical Models to Classify Dialogue Transition in Online Q&A Discussions*, Seo, S.W., Kang, J.H., **Drummond, J.**, and Kim, J., Proc. of the 15th International Conference on Artificial Intelligence in Education (AIED 2011), pages 550–553.

*Role of Elaborated Answers on Degrees of Student Participation in an Online Question-Answer Discussion Forum*, **Drummond, J.**, and Kim, J., Presented at 2011 Annual Meeting of the American Educational Research Association (AERA).

*In the Zone: Towards Detecting Student Zoning Out using Supervised Machine Learning*, **Drummond, J.**, and Litman, D., Proc. of the 10th International Conference on Intelligent Tutoring Systems (ITS 2010), pages 306–308.

*Evidence of Misunderstandings in Tutorial Dialogue and their Impact on Learning*, Jordan, P., Litman, D., Lipschultz, M., and **Drummond, J.**, Proc. of the 14th International Conference on Artificial Intelligence in Education (AIED 2009), pages 125–132.

## Working Papers

*A Natural Equilibrium for Stable Matching with an Interviewing Budget*, **Drummond, J.**, Borodin, A., and Larson, K.

## Awards and Academic Activities

**Program Committee, CoopMAS 2017**, (*8th Workshop on Cooperative Games in Multiagent Systems*).

**Microsoft Research PhD Fellowship Program Finalist**, 2016.

**Reviewer, Algorithmica**, 2015.

**Reviewer, SAGT 2015**, (*8th International Symposium on Algorithmic Game Theory*).

**Reviewer, AAAI-15**, (*Twenty-Ninth AAI Conference on Artificial Intelligence*).

**Ontario Graduate Scholarship**, 2014. *Scholarship includes \$15,000 in funding.*

**Reviewer, COMSOC-2014**, (*Fifth International Workshop on Computational Social Choice*).

**Microsoft Research Graduate Women's Scholarship Recipient**, 2012, deferred until 2013. *Scholarship includes \$15,000 in funding and \$2,000 conference stipend.*

**Google Anita Borg Memorial Scholarship Finalist**, 2012.

**Ontario Graduate Scholarship**, 2012. *Scholarship includes \$15,000 in funding.*

**Awardee of 2011 NSF Graduate Research Fellowship Program**, *Declined to study in Canada.*

**DREU Recipient**, *Chosen for Distributed Research Experience for Undergraduates Program, (Organized by CRA-W).*

**Best Undergraduate Poster**, *University of Pittsburgh Department of Computer Science 10th Annual Computer Science Day.*

## Research Experience

**Research Intern**, Microsoft Research, with Ian Kash and Peter Key, May 2016 to August 2016.

*Investigated simple pricing for cloud computing.*

**Research Assistant**, University of Toronto, Department of Computer Science, Dr. Craig Boutilier, August 2011 to December 2014; Dr. Allan Borodin and Dr. Kate Larson, January 2015 to Present.

*Investigating Bayes-Nash and ex-post equilibria for matching games with imperfect information.*

*Investigating stable and approximately stable matching using multi-attribute preference information.*

*Investigating elicitation schemes using multi-attribute based queries.*

*Investigating stable and approximately stable matching on social networks.*

*Investigated elicitation schemes for the stable matching problem, including a scheme that found low interview-cost matchings.*

*Investigated algorithms for finding stable and approximately stable matches with partial information regarding agents' preferences over alternatives.*

**Research Assistant**, University of Pittsburgh Department of Computer Science, Dr. Diane Litman, April 2008 to June 2010; September 2010 to May 2011.

*Investigated the impact of different training set populations on accurately classifying student uncertainty while using a spoken intelligent physics tutor.*

*Investigated applying the zoning out feature set to disengagement while using a spoken intelligent physics tutor.*

*Designed a feature set for and applied decision trees to classifying student zoning out while performing a spoken learning task.*

*Designed a feature set for categorizing student incorrectness categories and applied decision trees to build models to identify incorrectness categories.*

*Annotated spoken intelligent tutoring system for student incorrectness categories (e.g. too vague, etc.).*

**Directed Study**, University of Pittsburgh Department of Computer Science, Dr. Kirk Pruhs, September 2010 to December 2010.

*Analyzed and proved properties about an algorithm for dividing  $n$  indivisible objects among 2 people.*

**Research Assistant, DREU Program**, Information Sciences Institute, University of Southern California, Dr. Jihie Kim, June 2010 to August 2010.

*Applied HMM's and decision trees to students' online forum data to categorize students' posts.*  
*Performed a corpus study to analyze correlations between speech acts and thread length in students' online forum data.*  
*Annotated students' online forum data.*

## Teaching Experience

**Teaching Assistant**, University of Toronto Dept. of Computer Science, September 2011 to Present.

*Helping develop assignments, created marking schemes and marked exams and assignments for a upper level Intro to AI course.*

*Ran a weekly programming lab, which allows students to practice programming skills in a supervised, group environment. Also held office hours, graded assignments, and graded exams. Course was taught in Python.*

**Teaching Assistant**, University of Pittsburgh Dept. of Mathematics, September 2007 to April 2008.

*Taught College Algebra Recitation, held office hours, graded homework.*

**Tutor**, University of Pittsburgh Dept. of Mathematics, October 2006 to April 2007.

*Individual and Group Tutor, Subjects: College Algebra through Calculus III.*

## Technical Skills

**Programming Languages:** Proficient: Python, Java; Familiar: Julia, R, Matlab, Unix Shell Scripting (bash)

**Operating Systems:** Proficient: Linux, Mac OSX; Familiar: Windows

**Other Skills:** L<sup>A</sup>T<sub>E</sub>X, Weka

## References

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University of Toronto  
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Kate Larson,  
Associate Professor,  
Cheriton School of Computer Science  
University of Waterloo  
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Craig Boutilier,  
Principal Scientist  
Google  
and Professor of Computer Science (on leave)  
University of Toronto  
cebly@cs.toronto.edu

Diane Litman,  
Professor of Computer Science,  
Research Scientist with Learning Research and Development Center,  
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`litman@cs.pitt.edu`