

Aditya Bhargava

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*“The skeptic does not mean him who doubts, but him who investigates or researches, as opposed to him who asserts and thinks that he has found.”
-Miguel de Unamuno y Jugo*

Education

- 2011–present **Ph.D. Computer Science**, *University of Toronto*, Toronto, 3.8/4.0 GPA.
research area Natural language processing/computational linguistics
supervisor Gerald Penn
focus Semantic representations, neural networks, syntactic parsing, supertagging, spoken dialogue systems
- 2009–2011 **M.Sc. Computing Science**, *University of Alberta*, Edmonton, 3.6/4.0 GPA.
research area Natural language processing/computational linguistics
supervisor Grzegorz Kondrak
thesis title *Leveraging supplemental transcriptions and transliterations via re-ranking*
thesis description I investigated the problem of applying supplemental data to improve grapheme-to-phoneme conversion (G2P) and machine transliteration. I presented a unified method based on SVM re-ranking for leveraging related transliteration or transcription data to improve the performance of a base G2P or machine transliteration system. This re-ranking approach was shown to work across multiple base systems and achieved error reductions ranging from 8% to 43% over state-of-the-art base systems in cases where supplemental data were available.
- 2004–2009 **B.Sc. Computer Engineering with Distinction**, *University of Alberta*, Edmonton, 3.6/4.0 Engineering Graduation Average.

Publications

- spoken language understanding, intent prediction, slot detection **Aditya Bhargava**, Asli Celikyilmaz, Dilek Hakkani-Tür, and Ruhi Sarikaya. 2013. Easy contextual intent prediction and slot detection. In *Proceedings of the 2013 IEEE International Conference on Acoustics, Speech and Signal Processing*, pages 8337–8341, Vancouver, British Columbia, Canada, May. Institute of Electrical and Electronics Engineers.
<http://ieeexplore.ieee.org/xpl/articleDetails.jsp?arnumber=6639291>

- grapheme-to-phoneme, transliteration, combining data **Aditya Bhargava** and Grzegorz Kondrak. 2012. Leveraging supplemental representations for sequential transduction. In *Proceedings of the 2012 Conference of the North American Chapter of the Association for Computational Linguistics: Human Language Technologies*, pages 396–406, Montréal, Québec, Canada, June. Association for Computational Linguistics.
<http://www.aclweb.org/anthology/N12-1044.pdf>
- grapheme-to-phoneme, transliteration, combining data **Aditya Bhargava**. 2011. Leveraging supplemental transcriptions and transliterations via re-ranking. Master's thesis, University of Alberta.
<http://hdl.handle.net/10048/2127>
- transliteration, combining data **Aditya Bhargava**, Bradley Hauer, and Grzegorz Kondrak. 2011. Leveraging transliterations from multiple languages. In *Proceedings of the 3rd Named Entities Workshop (NEWS 2011)*, pages 36–40, Chiang Mai, Thailand, November. Asian Federation of Natural Language Processing.
<http://www.aclweb.org/anthology/W11-3206.pdf>
- relation extraction Filipe Mesquita, Ying Xu, **Aditya Bhargava**, Mirko Bronzi, Denilson Barbosa, and Grzegorz Kondrak. 2011. The effectiveness of traditional and open relation extraction for the slot filling task at TAC 2011. In *Proceedings of the Text Analysis Conference*, Gaithersburg, Maryland, USA, November. National Institute of Standards and Technology.
<http://www.nist.gov/tac/publications/2011/participant.papers/ualberta.proceedings.pdf>
- grapheme-to-phoneme, combining data **Aditya Bhargava** and Grzegorz Kondrak. 2011. How do you pronounce your name? Improving G2P with transliterations. In *Proceedings of the 49th Annual Meeting of the Association for Computational Linguistics: Human Language Technologies*, pages 399–408, Portland, Oregon, USA, June. Association for Computational Linguistics.
<http://www.aclweb.org/anthology/P11-1041.pdf>
- lexical semantics, compositionality Shane Bergsma, **Aditya Bhargava**, Hua He, and Grzegorz Kondrak. 2010. Predicting the semantic compositionality of prefix verbs. In *Proceedings of the 2010 Conference on Empirical Methods in Natural Language Processing*, pages 293–303, Cambridge, Massachusetts, USA, October. Association for Computational Linguistics.
<http://www.aclweb.org/anthology/D10-1029.pdf>
- transliteration, mining Sittichai Jiampojamarn, Kenneth Dwyer, Shane Bergsma, **Aditya Bhargava**, Qing Dou, Mi-Young Kim, and Grzegorz Kondrak. 2010. Transliteration generation and mining with limited training resources. In *Proceedings of the 2010 Named Entities Workshop*, pages 39–47, Uppsala, Sweden, July. Association for Computational Linguistics.
<http://www.aclweb.org/anthology/W10-2405.pdf>
- language origin detection, transliteration **Aditya Bhargava** and Grzegorz Kondrak. 2010. Language identification of names with SVMs. In *Human Language Technologies: The 2010 Annual Conference of the North American Chapter of the Association for Computational Linguistics*, pages 693–696, Los Angeles, California, USA, June. Association for Computational Linguistics.
<http://www.aclweb.org/anthology/N10-1102.pdf>
- transliteration Sittichai Jiampojamarn, **Aditya Bhargava**, Qing Dou, Kenneth Dwyer, and Grzegorz Kondrak. 2009. DirecTL: a language-independent approach to transliteration. In *Proceedings of the 2009 Named Entities Workshop: Shared Task on Transliteration (NEWS 2009)*, pages 28–31, Suntec, Singapore, August. Association for Computational Linguistics.
<http://www.aclweb.org/anthology/W09-3504.pdf>

phonology **Aditya Bhargava** and Grzegorz Kondrak. 2009. Multiple word alignment with Profile Hidden Markov Models. In *Proceedings of Human Language Technologies: The 2009 Annual Conference of the North American Chapter of the Association for Computational Linguistics, Companion Volume: Student Research Workshop and Doctoral Consortium*, pages 43–48, Boulder, Colorado, USA, June. Association for Computational Linguistics. <http://www.aclweb.org/anthology/N09-3008.pdf>

Honours, awards & scholarships

- 2015 **Ontario Graduate Scholarship.**
- 2012 **EMNLP-CoNLL Best Reviewer Award.**
- 2011 **University of Alberta Department of Computing Science Outstanding M.Sc. Thesis Award.**
- 2011–2014 **NSERC Alexander Graham Bell Canada Graduate Scholarship (CGS D3), awarded to 209/1684 applicants reviewed by NSERC.**
- 2010 **University of Alberta Faculty of Graduate Studies and Research Profiling Alberta's Graduate Students Award.**
- 2009 **University of Alberta Department of Computing Science M.Sc. Early Achievement Award.**
- 2009 **NAACL scholarship for JHU Summer School on Human Language Technology.**
- 2009 **NSERC Undergraduate Student Research Award.**
- 2008 **NSERC Undergraduate Student Research Award.**
- 2007–2008 **University of Alberta Jason Lang scholarship.**
- 2007–2008 **First Class Honours.**

Work experience

Research

- 2012 **Research Intern**, *Microsoft Research*, Sunnyvale, California.
Worked on contextualizing spoken language understanding, specifically for slot detection and intent prediction.

Teaching

- 2017 **Teaching Assistant**, *CSC 300: Computers and Society*, Department of Computer Science, University of Toronto.
Course covered the impacts of computers and technology on society, including privacy, environmental impacts, equality, automation, and more. Duties included running tutorials and marking assignments.
- 2016 **Teaching Assistant**, *CSC 321: Introduction to Neural Networks*, Department of Computer Science, University of Toronto.
Course covered basic neural networks and requisite background, including logistic regression, multi-layer perceptrons, convolutional networks, recurrent networks, and more. Duties included running tutorials and marking assignments and exams.
- 2015–2016 **Teaching Assistant**, *HLP 101: Undergraduate help centre*, Department of Computer Science, University of Toronto.
Held biweekly office hours to help computer science undergraduate students with questions about assignments and other course material.

- 2015 **Teaching Assistant**, *CSC 120: Computer Science for the Sciences*, Department of Computer Science, University of Toronto.
Course covered basic Python programming with NumPy, targeted at non-CS majors. Duties included helping students, running tutorials, testing assignments, and marking exams.
- 2013–2015 **Teaching Assistant**, *BIG 102Y: The Internet: Saving our Civilization or Trashing the Planet?*, Faculty of Arts & Science, University of Toronto.
Interdisciplinary year-long course for first-years prompting them to think critically about the Internet and its positive and negative aspects, including societal, environmental, and psychological effects. Duties included running tutorials, helping students, assignment marking, exam marking, running office hours, and occasionally providing input for assignment and tutorial design.
- winter 2013 **Teaching Assistant**, *CSC 190H: Computer Algorithms and Data Structures*, Department of Computer Science, University of Toronto.
Course covered C programming, algorithms relating to various data structures, sorting, algorithm analysis, memory organization, and dynamic memory. Duties included helping students, testing students in person, exam invigilating, and running review sessions.
- fall 2012 and winter 2013 **Teaching Assistant**, *CSC 148H: Introduction to Computer Science*, Department of Computer Science, University of Toronto.
Course covered object-oriented programming and design, basic data structures, and basic algorithm analysis. Duties included helping students, marking assignments and exams, and exam invigilating.
- winter 2012 **Teaching Assistant**, *CSC 209H: Software Tools and Systems Programming*, Department of Computer Science, University of Toronto.
Course covered Bash, basic UNIX tools, C, and basic UNIX programming. Duties included helping students, marking assignments and exams, and exam invigilating.
- fall 2011 **Teaching Assistant**, *CSC 108H: Introduction to Computer Programming*, Department of Computer Science, University of Toronto.
Course covered introductory Python programming. Duties included presenting labs, helping students, marking assignments, writing assignment auto-testing scripts, and exam invigilating.
- 2009–2011 **Teaching Assistant**, *CMPUT 201: Practical Programming Methodology*, Department of Computing Science, University of Alberta.
Course covered basic Linux use and C programming. Duties included presenting lectures in labs, helping students, marking assignments, and writing some exam questions.

Software development

- 2007 **Software Developer**, *Zedi Canada Inc.*, Edmonton, Alberta.
Completed various projects centred on migrating various in-use systems to Team Foundation Server including PVCS, Subversion, and FogBugz.
- 2006 **Junior Software Developer**, *zed.i solutions*, Edmonton, Alberta.
Completed various projects related to software developer workflow including unit test framework implementation, automated debugging, and CruiseControl.NET implementation.

Service

Professional activities

- 2017 **Secondary reviewer**, *The 15th Conference of the European Chapter of the Association for Computational Linguistics (EACL 2017)*, Valencia, Spain, April 3–7, 2017.

- 2012 **Student volunteer**, *The 2012 Annual Conference of the North American Chapter of the Association for Computational Linguistics: Human Language Technologies (NAACL-HLT 2012)*, Montréal, Québec, Canada, June 3–8, 2012.
- 2012 **Program committee: reviewer**, *The 2012 Joint conference on Empirical Methods in Natural Language Processing and Computational Natural Language Learning (EMNLP-CoNLL 2012)*, Jeju Island, Korea, July 12–14, 2012.
- 2011 **Secondary reviewer**, *The 2011 Named Entities Workshop (NEWS 2011)*, Chiang Mai, Thailand, November 12, 2011.
- 2011 **Student volunteer**, *The 49th Annual Meeting of the Association for Computational Linguistics: Human Language Technologies (ACL-HLT 2011)*, Portland, Oregon, USA, June 20–24, 2011.
- 2011 **Secondary reviewer**, *Canadian Conference on Artificial Intelligence 2011 (AI 2011)*, St. John's, Newfoundland, Canada, May 25–27, 2011.
- 2010 **Secondary reviewer**, *The 2010 Conference on Empirical Methods in Natural Language Processing (EMNLP 2010)*, Cambridge, Massachusetts, USA, October 9–11, 2010.
- 2010 **Secondary reviewer**, *The 23rd International Conference on Computational Linguistics (Coling 2010)*, Beijing, China, August 23–27, 2010.
- 2010 **Secondary reviewer**, *The 2010 Named Entities Workshop (NEWS 2010)*, Uppsala, Sweden, July 16, 2010.
- 2010 **Secondary reviewer**, *The Joint Fifth Workshop on Statistical Machine Translation and MetricsMATR (WMT 2010)*, Uppsala, Sweden, July 15–16, 2010.
- 2010 **Secondary reviewer**, *The 48th Annual Meeting of the Association for Computational Linguistics (ACL 2010)*, Uppsala, Sweden, July 12–14, 2010.
- 2010 **Student volunteer**, *Human Language Technologies: The 2010 Annual Conference of the North American Chapter of the Association for Computational Linguistics (NAACL-HLT 2010)*, Los Angeles, California, USA, June 2–6, 2010.
- 2010 **Secondary reviewer**, *Canadian Conference on Artificial Intelligence 2010 (AI 2010)*, Ottawa, Ontario, Canada, May 31–June 2, 2010.
- 2010 **Secondary reviewer**, *The Seventh International Conference on Language Resources and Evaluation (LREC 2010)*, Malta, May 19–21, 2010.
- 2009 **Secondary reviewer**, *The 2009 Named Entities Workshop (NEWS 2009)*, Suntec, Singapore, August 7, 2009.

University of Toronto

- 2015–present **Treasurer**, *Computer Science Graduate Students' Benevolent Society*.
Kept track of group finances, including putting together an annual budget, as well as assisting the President with miscellaneous matters such as organizing events.
- 2014–2016 **Cookiemaster**, *Computer Science Graduate Students' Benevolent Society*.
Organized weekly social cookiebreaks for graduate students in the Department of Computer Science.
- 2011–2016 **GSU Council Representative**.
Served as one of the Department of Computer Science's representatives to the Graduate Students' Union (GSU) General Council, which addresses issues including GSU policy, budget, and other issues pertinent to graduate students at the University of Toronto.

Electronics and software projects

- 2008–2010 **Vice-President & Electronics Team Leader**, *University of Alberta Space Elevator Racing Team*, Edmonton.
Engineering student project in which we worked toward building a machine to climb a 1 km tether using laser power from the ground. Part of NASA's Space Elevator: 2010 competition.
- 2009 **TICK-TOCK: Tenacious Internet-Capable Klock that is Tremendously Obstinate and Cannot be Killed.**
Computer engineering capstone project for an alarm clock with touch-enabled LCD screen, weight sensors, and Internet connection to prevent user from returning to bed.
- 2006 **Kiwi.**
Applied evolutionary algorithms to the design of a custom keyboard layout based on a user's requirements (such as missing fingers, etc.).

Relevant coursework

- winter 2014 **CSC 2514H**, *Human-Computer Interaction*, University of Toronto.
fall 2011 **CSC 2511H**, *Computational Linguistics*, University of Toronto.
winter 2010 **CMPUT 650**, *Natural Language Processing*, University of Alberta.
winter 2010 **CMPUT 610**, *Reinforcement Learning for Artificial Intelligence*, University of Alberta.
winter 2009 **CMPUT 466/551**, *Machine Learning*, University of Alberta.
winter 2008 **LING 101**, *Introduction to Linguistic Analysis*, University of Alberta.

Professional memberships

- 2009–2012 **Association for Computational Linguistics (ACL).**

Technical proficiencies

languages	Python, C/C++, Bash	frameworks	Blocks, Theano
general	natural language processing, machine learning	basics	NumPy, L ^A T _E X, CUDA, C#

Language proficiencies

english	Native	<i>Native Canadian English speaker</i>
hindi	Limited working	<i>Mother tongue</i>
french	Limited working	<i>Some immersion and other classes</i>