Aditya Bhargava

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Education

IN PROGRESS **Ph.D. Computer Science**, *University of Toronto*, Toronto, 3.8/4.0 GPA

research area Natural language processing/computational linguistics

supervisor Gerald Penn

thesis title *Subcategorial parsing of categorial grammars*

focus Syntactic parsing, neural networks, categorial grammars, supertagging

GRADUATE **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.

UNDERGRADUATE **B.Sc. Computer Engineering with Distinction**, *University of Alberta*, Edmonton, 3.6/4.0 Engineering Graduation Average

Publications

lcg, parsing, proof net

Aditya Bhargava and Gerald Penn. 2021. Proof net structure for neural Lambek categorial parsing. In *Proceedings of the 17th International Conference on Parsing Technologies and the IWPT 2021 Shared Task on Parsing into Enhanced Universal Dependencies (IWPT 2021)*, pages 13–25, Online, August. Association for Computational Linguistics.
`https://aclanthology.org/2021.iwpt-1.2`

ccg, supertagging, parsing

Aditya Bhargava and Gerald Penn. 2020. Supertagging with CCG primitives. In *Proceedings of the 5th Workshop on Representation Learning for NLP*, pages 194–204, Online, July. Association for Computational Linguistics.
`https://aclanthology.org/2020.repl4nlp-1.23`

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, Canada, May. Institute of Electrical and Electronics Engineers.
`https://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, Canada, June. Association for Computational Linguistics.
https://aclanthology.org/N12-1044

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.
https://aclanthology.org/W11-3206

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, USA, November. National Institute of Standards and Technology.
https://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, USA, June. Association for Computational Linguistics.
https://aclanthology.org/P11-1041

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, USA, October. Association for Computational Linguistics.
https://aclanthology.org/D10-1029

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.
https://aclanthology.org/W10-2405

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, USA, June. Association for Computational Linguistics.
https://aclanthology.org/N10-1102

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.
https://aclanthology.org/W09-3504

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, USA, June. Association for Computational Linguistics.
`https://aclanthology.org/N09-3008`

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

2018–2021 **Teaching Assistant**, *CSC 485/2501: Computational Linguistics*, Department of Computer Science, University of Toronto
Course covered grammars, parsing, lexical semantics, thematic roles, and anaphora resolution. Duties included running tutorials, answering student questions, refining an assignment in TensorFlow as well as porting to PyTorch, developing an automarker, and marking assignments.

2020 **Head Teaching Assistant**, *CSC 485/2501: Computational Linguistics*, Department of Computer Science, University of Toronto
Course covered grammars, parsing, lexical semantics, thematic roles, and anaphora resolution. Duties included managing TAs, developing assignments and automarkers, running tutorials, and answering student questions.

2020 **Teaching Assistant**, *CSC 2020: Systems Thinking for Global Problems*, Department of Computer Science, University of Toronto
Course covered general systems theory, systems dynamics, complexity science, and soft systems methodology, and critical system theory. Duties included assisting with running lectures and marking student presentations.

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

2021 **Reviewer**, *The 60th Annual Meeting of the Association for Computational Linguistics*, Dublin, Ireland, May 22–27, 2022

2021 **Emergency reviewer**, *SyntaxFest 2021*, Sofia, Bulgaria, March 21–25, 2022

2021 **Reviewer**, *Workshop on Insights from Negative Results in NLP*, Punta Cana, Dominican Republic/Online, November 10, 2021

2021 **Reviewer & secondary reviewer**, *The 59th Annual Meeting of the Association for Computational Linguistics and the 11th International Joint Conference on Natural Language Processing (ACL-IJCNLP 2021)*, Online, August 1–6, 2021

2021 **Reviewer**, *The 16th Conference of the European Chapter of the Association for Computational Linguistics (EACL 2021)*, Online, April 19–23, 2021

2020 **Reviewer**, *The 2020 Conference on Empirical Methods in Natural Language Processing (EMNLP 2020)*, Online, November 16–18, 2020

2020 **Secondary reviewer**, *The 21st Annual Conference of the International Speech Communication Association (INTERSPEECH 2020)*, Shanghai, China, October 25–29, 2020

2020 **Secondary reviewer**, *The 58th Annual Meeting of the Association for Computational Linguistics (ACL 2020)*, Seattle, USA, July 6–10, 2020

2019 **Secondary reviewer**, *The 28th International Joint Conference on Artificial Intelligence (IJCAI 2019)*, Macao, China, August 10–16, 2019

2019 **Secondary reviewer**, *The 2019 Conference of the North American Chapter of the Association for Computational Linguistics: Human Language Technologies (NAACL-HLT 2019)*, Minneapolis, USA, June 2–7, 2019

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, Canada, June 3–8, 2012

2012 **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, USA, June 20–24, 2011

2011 **Secondary reviewer**, *Canadian Conference on Artificial Intelligence 2011 (AI 2011)*, St. John's, Canada, May 25–27, 2011

2010 **Secondary reviewer**, *The 2010 Conference on Empirical Methods in Natural Language Processing (EMNLP 2010)*, Cambridge, 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

2017 **Graduate student member**, *Graduate Department Academic Appeals Committee*
Review the details of an appeal to have a grade altered for a graduate course and come to a unanimous decision about it.

2015–2017 **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.

Technical proficiencies

frameworks	PyTorch, NumPy, CUDA, TensorFlow, Keras
tools	PyCharm, Git, Vim, Bash, SLURM, LaTeX
languages	Python, C/C++
general	Natural Language Processing, Machine Learning

Language proficiencies

english	Native	*Native Canadian English speaker*
hindi	Limited working	*Mother tongue*
french	Limited working	*Some immersion and other classes*