

ARYA D. MCCARTHY

Contact Information	<p>Department of Computer Science Johns Hopkins University Hackerman 321 3400 North Charles Street Baltimore, MD 21218, USA</p>	<p>Phone: (469) 834-3984 arya@jhu.edu cs.jhu.edu/~arya</p>
Education	<p>Johns Hopkins University Ph.D. in Computer Science Affiliation: Center for Language and Speech Processing Advisor: David Yarowsky</p> <p>Southern Methodist University M.S. in Computer Science Thesis: The Leximin Method for Hierarchical Community Detection Advisor: David W. Matula</p> <p>Southern Methodist University B.S. in Computer Science, Mathematics Magna Cum Laude; Honors in the Liberal Arts, University Honors Program</p> <p>Single terms of study at the <i>University of Edinburgh</i> (2015) and <i>Stanford University</i> (2014)</p>	<p>Ongoing</p> <p>2017</p> <p>2017</p>
Employment	<p>SCALE 2018 Machine Translation Researcher Host: Kevin Duh, Ph.D.</p> <p>Darwin Deason Institute for Cyber Security Research Assistant Host: Mitch Thornton, Ph.D.</p>	<p>June – August 2018</p> <p>October 2015 – May 2016</p>
Fellowships	<p>Robert Mayer Interdisciplinary Fellowship Awarding body: SMU Dedman College Interdisciplinary Institute Amount: \$1,500 Supervisor: Scott Norris, Ph.D. and Matthew Wilson, Ph.D. Coming Together, Mathematically: Dynamical Models for Increased Uniformity and Polarization in American Politics.</p> <p>Hamilton Undergraduate Research Fellowship Awarding body: Southern Methodist University Amount: \$3,000 Supervisor: Scott Norris, Ph.D. Implemented and extended waveform relaxation solver for modeling interrelated differential equations without loss of accuracy.</p> <p>Harvard–Amgen Scholarship Awarding body: Harvard University; Amgen Foundation Amount: \$4,500 Supervisor: Stuart Shieber, Ph.D. Toward coreference resolution shared task, adapted multithreaded feature extraction code in Java to serialize and deliver features to Torch neural network.</p>	

Teaching

Southern Methodist University Doing Data Science (MSDS 6306)

Spr., Sum., Fall 2018

Role: Teaching Assistant

Professor: Faizan Javed

For two sections, I assisted weekly synchronous sessions and graded reports in SAS, Python, and R. Part of SMU's Master's of Science in Data Science program.

Southern Methodist University Quantifying the World (MSDS 7333)

Fall 2017

Role: Grader

Professor: Owen Martin, John Verostek

Southern Methodist University Fundamentals of Algorithms (CSE 3353)

Fall 2014

Role: Teaching Assistant

Professor: Tyler Moore, Ph.D.

Led 2 office hours weekly, answered questions via Piazza, and graded all assignments and exams for 30 students.

Awards

- **President's Scholarship.** Highest merit scholarship at SMU. Full tuition, funded study abroad, and dinners with Tate Lecture speakers. One of 21 in class of 2017.
- **Campus Community Award.** Full room and board scholarship awarded for leadership and impact on campus. Approximately 90 chosen each year.
- **Robert S. Hyer Society.** Highest academic honor at SMU. One of 12 juniors selected in 2016.
- **Charles J. Pipes Award for Outstanding Performance in Mathematics.** One chosen each year.
- **Dean's Award.** Best CSE poster at **SMU Research Day 2017**: Nibhrat Lohia, Raunak Mundada, **Arya D. McCarthy**. *AirWare: An Advanced In-Air Hand-Gesture Recognition System Using Ultrasonic Doppler Signatures Leveraging Deep Neural Network Architectures*.
- Tau Beta Pi (as sophomore)
- Upsilon Pi Epsilon (as junior)

Publications

Refereed Conference Papers

1. Christo Kirov, Ryan Cotterell, John Sylak-Glassman, Géraldine Walther, Ekaterina Vylomova, Patrick Xia, Manaal Faruqui, **Arya D. McCarthy**, Sandra Kübler, David Yarowsky, Jason Eisner, and Mans Hulden. 2018. **UniMorph 2.0: Universal Morphology**. In *Proceedings of the Ninth International Conference on Language Resources and Evaluation (LREC)*. European Language Resources Association (ELRA).

Refereed Workshop Proceedings

2. Brian Thompson, Huda Khayrallah, Antonios Anastasopoulos, **Arya D. McCarthy**, Kevin Duh, Rebecca Marvin, Paul McNamee, Jeremy Gwinnup, Tim Anderson and Philipp Koehn. 2018. Freezing Subnetworks to Analyze Domain Adaptation in Neural Machine Translation. In *EMNLP Workshop on Analyzing and Interpreting Neural Networks for NLP*, Brussels, Belgium. ACL. (To appear)

3. **Arya D. McCarthy** and David W. Matula. 2018. Normalized Mutual Information Exaggerates Community Detection Performance. In *SIAM Workshop on Network Science*, Portland, USA. Society for Industrial and Applied Mathematics.

Non-Public Technical Reports

4. **Arya D. McCarthy**. 2016. Design and Implementation of a Method of Abstractly Simulating Cyber Security Vulnerabilities: Embedded Markov and Discrete Event Simulation Approaches. *Deason Institute for Cyber Security*.

Non-Refereed

1. **Arya D. McCarthy**, Scott A. Norris. 2017. Toward Fast, Accurate Simulation of Gap Junctions in NNs. *National Collegiate Research Conference*. (Abstract)
2. **Arya D. McCarthy**, Sam Wiseman, Stuart Shieber. 2015. Toward Multilingual Neural Coreference Resolution. *Harvard-Amgen Scholars Program*. (Abstract)

Invited Talks

1. Coming Together, Mathematically: Dynamical Models for Increased Uniformity and Polarization in American Politics. *May 2017*
Location: Southern Methodist University (Hamilton Fellows Series)
Host: Kathleen Hugley-Cook
2. Toward Fast, Accurate Simulation of Gap Junctions in NNs. *March 2017*
Location: Southern Methodist University (as Summer Research Fellow)
Host: Robert Kehoe

Service

Shared Task Organizer

- **CoNLL-SIGMORPHON 2018 Shared Task: Cross-Lingual Morphological Reinflection**

Professional Service

- Program Committee, **SIGMORPHON (2018)**
- Reviewer: WMT (2018)
- Open-source contributions: **networkx**, PyTorch, scikit-learn, OpenNMT-py
- Webmaster: **ACL SIGMORPHON**, **UniMorph morphology project**, **SMU Ubiquitous Computing Lab** (2016–2017)
- Founder and editor-in-chief, *SMU Journal of Undergraduate Research* (2014–2017)
- Editor-in-chief, *Kairos* interdisciplinary magazine (2015–2016)

University Service

- Judge for **ACM-ICPC** contest at JHU
- Diversity and Inclusion Committee for **Department of Computer Science**
- Faculty Liaison Committee for **CLSP**
- Vice-President, SMU Tau Beta Pi (2016–2017)
- President, SMU Upsilon Pi Epsilon (2015–2017)
- Sole student member of SMU Undergraduate Research Steering Committee
- Common Reading selection committee, SMU

References

David Yarowsky (yarowsky@jhu.edu), **Johns Hopkins University**
Ryan Cotterell (rcotter2@jhu.edu), **Cambridge University**
David W. Matula (matula@smu.edu), **Southern Methodist University**
Scott A. Norris (snorris@smu.edu), **Southern Methodist University**
Eric C. Larson (eclarson@smu.edu), **Southern Methodist University**
Daniel W. Engels (dwe@alum.mit.edu), **Southern Methodist University**

Skills

Formal Languages: Python, R, SAS, C++, SQL, Objective-C, Java, JavaScript, MATLAB, \LaTeX

Machine Learning Frameworks: PyTorch, scikit-learn, TensorFlow

Natural Languages: English, Farsi, Spanish, Italian, Romanian (written); basic Dutch and German

Graduate-Level Coursework in Computer Science: Linguistic & Sequence Modeling, Machine Translation, Machine Learning in Python, Data Mining, Algorithm Engineering, Computer Architecture, Linear Programming

Graduate-Level Coursework in Mathematics and Statistics: Bayesian Statistics, Linear Programming, Data Science, Numerical Methods I (numerical linear algebra) and II (numerical analysis), Mathematical Models in Biology

Extracurricular Activities

Bagpiper
Ballroom Dancer