Arya D. McCarthy

Contact Information

Department of Computer Science
Johns Hopkins University
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Education

Johns Hopkins University *Ongoing*
Ph.D. in Computer Science
Affiliation: Center for Language and Speech Processing
Advisor: David Yarowsky

Southern Methodist University *2017*
M.S. in Computer Science
Thesis: The Leximin Method for Hierarchical Community Detection
Advisor: David W. Matula

Southern Methodist University *2017*
B.S. in Computer Science, Mathematics
Magna Cum Laude; Honors in the Liberal Arts, University Honors Program

Single terms of study at the University of Edinburgh (2015) and Stanford University (2014)

Employment

Darwin Deason Institute for Cyber Security *October 2015 – May 2016*
Research Assistant
Host: Mitch Thornton, Ph.D.

Fellowships

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.

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.

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.

Teaching

Southern Methodist University *Spring 2018, Summer 2018*
Doing Data Science (MSDS 6306)
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 *Fall 2017*
Quantifying the World (MSDS 7333)
Role: Grader
Professor: Owen Martin, John Verostek

Southern Methodist University *Fall 2014*
Fundamentals of Algorithms (CSE 3353)
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, 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. **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. (To appear)

Non-Public Technical Reports

3. **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.*

Invited Talks

1. 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

- Multiple contributions to `networkx` open-source library
- Contributor to `scikit-learn` open-source library
- Webmaster for ACL SIGMORPHON
- Webmaster for UniMorph morphology project
- Webmaster for 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
David W. Matula (matula@smu.edu), Southern Methodist University
Scott 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