

AMEL AWADELKARIM

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EDUCATION

Stanford University Ph.D. in Computational and Mathematical Engineering (expected 2023) <i>National Science Foundation (NSF) Graduate Research Fellow</i> Dissertation: “Applications of algorithmic design and choice-modeling in real-world graph systems” Advised by: Johan Ugander	Sept 2017 - present
The Pennsylvania State University M.S. in Engineering Science & Mechanics - GPA: 4.0/4.0	Aug 2016 - Dec 2017
The Pennsylvania State University B.S. in Engineering Science - Major GPA: 3.82/4.0 <i>Minor in Mathematics</i>	Aug 2012 - Aug 2016

TECHNICAL HIGHLIGHTS

Research Interests	Computational social science, personalization & recommender systems
Relevant Courses	Applied Statistics, Machine Learning, Discrete Math & Algorithms, Optimization, Numerical Linear Algebra
Languages & Tools	Python (numpy, pandas, PyTorch, matplotlib, Jupyter notebook), git

WORK EXPERIENCE

Google - Software Engineering Internship	Jun 2019 - Sept 2019
<ul style="list-style-type: none">Developed an alternative quality score to the average-star-rating of Google Maps features (places) by applying a Bayesian skill-rating system on existing ratings.Average star-ratings suffer from the cold-start problem—our resulting metric better captures quality of new or scarcely-rated features by leveraging head-to-head comparisons within user ratings of like-places.The new metric aids in the decision-making of what to rank for Google Maps search results.	

PUBLICATIONS

- A Awadelkarim, I Ashlagi, I Lo, J Ugander. “Equilibrium analysis of smart-matching-platform interventions in school choice”. (In preparation).
- A Awadelkarim, A Seshadri, I Ashlagi, I Lo, J Ugander. “Rank-heterogeneous preference modeling for school choice”. (Pre-print).
- A Awadelkarim, J Ugander. “[Prioritized restreaming algorithms for balanced graph partitioning](#)”. Proc. 26th ACM SIGKDD Int’l Conf. on Knowledge Discovery and Data Mining (KDD), 2020.

RESEARCH PROJECTS

Preference modeling for school choice <i>PhD Research - Stanford University</i>	Jan 2021 - present
<ul style="list-style-type: none">Applying recent advancements in discrete choice and ranking models to improve preference models for school choice research using San Francisco Unified School District (SFUSD) preference data.Simulating and analyzing market effects of lengthening submitted rankings lists with improved models.	

- *Why it matters:* This research advances our ability to analyze school choice mechanisms, and better analysis lead to better childhood educational outcomes.

“Prioritized restreaming algorithms for balanced graph partitioning” May 2018 - Feb 2020
PhD Research - Stanford University

- Developed a new family of balanced graph-partitioners and published a taxonomy of existing methods.
- Empirically compared the new class of algorithms with a number of existing graph partitioning techniques, providing benchmarking that was previously void in the literature.
- *Why it matters:* Our method is most-effective at minimizing the edge-cut objective compared to state-of-the-art algorithms, and can aid in efficient large-scale distributed graph computation.

“Training a playlist curator based on user taste” Sept 2018 - Dec 2018
Project - Stanford University

- Built a playlist classifier, mapping a list of unclassified songs to user-created playlists based on similarity.
- Performed feature engineering, collecting Spotify API features like Spotify song metadata and artist genre tags, and computing node2vec artist embeddings, learned from related-artists graph.
- Trained, validated, and tested various ML models, including neural network, SVMs, and perceptron.

“Finite-element implementation and verification of complex fluid models based on evolving natural configurations, motivated by studies of blood” May 2015 - Aug. 2017
Graduate Research - The Pennsylvania State University

- Numerically modeled novel thrombectomy procedure for less-invasive blood clot removal.
- Developed finite-element scheme using COMSOL Multiphysics to numerically solve balance laws of momentum and mass with a continuum model for an Oldroyd-B fluid and for blood.
- *Why it matters:* New surgical procedures require great testing, in-vitro or in-vivo; computational simulation is a safe and inexpensive first step toward development and adoption.

PRESENTATIONS

- Poster presentation, “Improved preference modeling for school choice”, International Conference on Computational Social Science (IC2S2), Jul 2022.
- Contributed talk, “Designing defaults for school choice”, NeurIPS Workshop for Human and Machine Decisions (WHMD), Nov 2021. [Recorded talk.](#)
- Poster presentation, “Designing defaults for school choice”, NeurIPS Workshop for Human and Machine Decisions (WHMD), Nov 2021.
- Oral and poster presentation, “Prioritized restreaming algorithms for balanced graph partitioning”, International Conference on Knowledge Discovery and Data Mining (KDD), Jul 2020. [Slides.](#)
- Contributed talk, “Prioritized restreaming algorithms for balanced graph partitioning”, SIAM Network Science (SIAMNS) Workshop, Jun 2020.
- Seminar talk, “Prioritized restreaming algorithms for balanced graph partitioning”, Stanford Women in Math Mentoring Research Seminar, May 2020.

ACTIVITIES

Member - [San Francisco Fury](#) Jun 2018 - present

- Elite women’s Ultimate frisbee club, based in the Bay Area. National champions in 2018 & 2021.

Coach - Stanford Women’s Ultimate team Sept 2019 - Dec 2020

- Awarded [coaches of the year](#) across the entire college division.