Yacoub Kureh
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UCLA Dept. of Mathematics
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Education

University of California, Los Angeles — Los Angeles, CA

Ph.D. Candidate in Mathematics — September 2014 – June 2020 (expected)
Research Interests: Network Science and Data Analysis.
Research Topics: Studying social behavior using coevolving voter models and joint point process models with temporal networks. Analyzing integrated circuit configurations and manufacturability using persistent homology.
Advisor: Mason A. Porter
Advanced to Candidacy: March 15, 2018
Honors: NSF Graduate Research Fellowship Honorable Mention, SIAM Student Travel Award

University of Cambridge (Emmanuel College) — Cambridge, UK

Master of Advanced Study in Mathematics (Part III of the Mathematical Tripos) — October 2013 – June 2014
Herchel Smith Fellowship

Harvard University — Cambridge, MA

A.B. cum laude in Mathematics with secondary field in Physics. GPA: 3.97 — August 2009 – May 2013
Honors and Grants:

- Inducted into Phi Beta Kappa as "Junior 24"
- Harvard Foundation Insignia Award (2013) for 'outstanding contributions to intercultural and race relations'
- Detur Book Prize (2010) for 'very high academic standing in student's first year'
- John Harvard Scholarships (2010, 2011) for being in the top 5% of the class of 2013
- Harvard Global Health Initiative Grant (Summer 2013)
- David Rockefeller Grant to study Arabic at Yarmouk University in Jordan (Summer 2010)

Papers

1. **Kureh, Y.***, Dai, V., Capodieci, L., (2019) *Persistent homology analysis of complex high dimensional layout configurations for IC physical designs*. Proceedings Volume 10962, Design-Process-Technology Co-optimization for Manufacturability XIII; 1096207
2. **Kureh, Y.***, Porter, M. A., (2019) *Fitting In and Breaking Up: Nonlinear Versions of Coevolving Voter Models*. arXiv:1907.11608 (submitted to Physical Review E)

Conference Presentations

1. **Kureh, Y.***, Dai, V., Capodieci, L., (February 2019) *Persistent homology analysis of complex high dimensional layout configurations for IC physical designs*. Paper presented at SPIE Advanced Lithography Conference.
2. **Kureh, Y.***, Porter, M. A., (May 2019) *Fitting In and Breaking Up: Rules that speed up time to consensus in the Coevolving Voter Model*. Presented at SIAM Conference on Application of Dynamical Systems.
3. **Kureh, Y.***, Brantingham, P. J., Porter, M. A., (May 2019) *Coupled Point Processes and Network Evolution Dynamics*. Presented at SIAM Workshop on Network Science.

Talks

1. University of Limerick, Department of Mathematics, MACSI Seminar (July 31, 2019)
2. University of Oxford, Mathematical Institute, Networks Seminar (August 20, 2019)

Academic Services

1. Refereed for: SIAM Journal on Applied Mathematics
2. Volunteered for: Cambridge Afterschool Program, Phillips Brooks House Association's ExperiMentors
3. Student Advisory Board for the Harvard College Writing Program

Professional Experience

Mathematics and Computer Science Departments — Harvard University and UCLA

Teaching Fellow — 2011 – Present

- Prepared and led weekly/biweekly discussion sections for 15 – 90 students.
- Held office hours, facilitated online question-and-answer forums, and graded homework, projects, and exams.
- Upper Division Mathematics Courses: Network Science, Optimization
- Lower Division Mathematics Courses: Linear Algebra Honors, Differential Equations, Calculus, and Probability
- Computer Courses: Introduction to Computer Science, Beginning Programming, and Intermediate Programming

Motivo Data Analytics — Sunnyvale, CA

Research Intern — Summers 2017 and 2018

- Investigated how methods of topological data analysis can be applied to semiconductor manufacturing.
- Developed methods and algorithms for analyzing integrated circuit design layouts using persistent homology.
- This work was presented at the 2019 SPIE Advanced Lithography Conference in San Jose, CA.

Jane Street Capital — New York, NY

Trading Intern — Summer 2012

- Performed preliminary research to enhance bid-ask spread and edge calculations in algorithmic trading systems.
- Designed several tools to facilitate arbitrage strategies for bonds, commodities, and volatility instruments.

Aizenberg Research Group — Harvard University

Research Intern — 2010 – 2012

- Explored mathematical models to predict the geometries of self-organizing nanobristle lattices.
- Evaluated numerical simulations of various differential models against experimental data.

Leadership Positions

UC-Student Workers Union — UCLA

Head Steward — 2015 – 2017

Campaigned for student-led diversity initiatives. Assisted the organization of several sub-committees. Presented information sessions at graduate student orientations to encourage active union participation.

Campus Programs Committee — UCLA

Chair — 2014 – 2016

Appraised funding proposals for student initiated and operated programs offered to the UCLA student body. Solicited student views on the nature and goals of campus programming and held hearings to allocate funds.

Graduate Student Union (MCR) — Emmanuel College, Cambridge University

Secretary — 2013 – 2014

Supervised the biweekly meetings of the Emmanuel College MCR, which represents a body of over 200 graduate students. Organized a monthly seminar for students to present their research to their colleagues and peers.

Ceramics United — Cape Town, South Africa

Co-founder — 2013 – 2015

Established an integrated Art Education-Art Competition program in South Africa that connects world-renowned artists with students and funds creative after-school programs through our partner, Imagine Scholar. Received official World Design Capital 2014-Cape Town sponsorship and publicity. Crowd-funded over 20,000 ZAR to expand operations and create more exhibition opportunities for students. Received Harvardwood Heroes grant in 2015.

Additional Skills

- **Computer:** C++, Python, Mathematica, MATLAB, C, R, and FORTRAN.
- **Languages**: Conversational Arabic. Beginning French and Italian.