

VICKY CHUQIAO YANG

Omidyar Fellow and Peters Hurst Scholar, Santa Fe Institute

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Education

- Ph.D. Applied Mathematics** 2018
Northwestern University, Evanston, IL
Research focus: Mathematical models of collective human behavior
Advised by: Daniel M. Abrams
- M.S. Applied Mathematics** 2014
Northwestern University
- B.S. Mathematical Sciences; B.S. Physics** 2013
Worcester Polytechnic Institute (WPI), Worcester, MA
With high distinction

Academic Positions

- Santa Fe Institute (SFI)**, Santa Fe, NM 2018–present
Omidyar Fellow and Peters Hurst Scholar
- Northwestern University**, Evanston, IL 2014–2018
Research Assistant in Applied Mathematics
- Argonne National Laboratory**, Lemont, IL 2012
Lee Teng Intern in Accelerator Physics
- Worcester Polytechnic Institute**, Worcester, MA 2010–2012
Research Assistant, Social Psychology Inquiry Lab

Industry Positions

- Airbnb Inc.**, San Francisco, CA 2017
Data Scientist Internship

Awards and Fellowships

- Omidyar Fellowship, Santa Fe Institute 2018
- Grand Prize in Interactive Data Visualization,
Northwestern University Computational Research Day 2018
- The Red Sock Award for Best Poster Presentation,
SIAM Conference on Applications of Dynamical Systems 2017
- SIAM Student Chapter Certificate of Recognition 2017
- Terminal Year Fellowship, Northwestern University 2017
- Integrated Data Science Traineeship, Northwestern University 2016
- Walter Murphy Fellowship, Northwestern University 2013
- First Place, Student Paper Competition at Annual Microwave Power
Symposium held by International Microwave Power Institute 2013
- Second Place, IEEE Student Paper Competition 2013

Manuscripts under Review

- **V.C. Yang**, T. van der Does, H. Olsson, “Falling through the cracks: a dynamical model for the formation of in-groups and out-groups,” under review.
Preprint: <https://arxiv.org/abs/1911.10419>

Peer-reviewed Publications in Journals

- **V.C. Yang**, D.M. Abrams, G. Kernell, A.E. Motter, “Why are US parties so polarize? A ‘satisficing’ dynamical model,” *SIAM Review*, 62(3), 64665 (2020).
- L.M.A. Bettencourt, **V.C. Yang**, J. Lobo, C. Kempes, D. Rybski, M. Hamilton, “The interpretation of urban scaling analysis in time,” *Journal of the Royal Society Interface*, 17, 163 (2020).
- **V.C. Yang**, A.V. Papachristos, D.M. Abrams, “The origin of urban-productivity scaling laws,” *Physical Review E*, 100, 032306 (2019).
- L. Lee*, S. Zhang*, **V.C. Yang**, “Do two parties represent the US? Clustering analysis of US public ideology survey,” *SIAM Undergraduate Research Online*, vol. 12 (2019). DOI: 10.1137/17S016518.
- B.S. Tilley, **V.C. Yang**, J.C. Baiense, and S. Evans, “Frequency-dependent thermal resistance of vertical U-tube geothermal heat exchangers”, *Journal of Engineering Mathematics*, 102 131-150 (2017).
- E.M. Moon, **C. Yang**, and V.V. Yakovlev, “Microwave-induced temperature fields in cylindrical samples of graphite powder—experimental and modeling studies,” *International Journal of Heat and Mass Transfer*, vol. 87, No 8, pp. 359–368 (2015).
- **C. Yang** and V.V. Yakovlev, “An efficient empirical model for microwave-induced average temperature of liquid cylindrical reactants,” *Journal of Microwave Power and Electromagnetic Energy*, 47 (3), pp. 177-185 (2013).

Peer-reviewed Publications in Conference Proceedings

- E.M. Moon, **C. Yang**, M. Patel, H. He, and V.V. Yakovlev, Microwave-induced temperature fields in graphite powder heated in a waveguide reactor. In: *Microwave Symposium, IEEE Microwave Theory and Techniques Society International*, pp. 1-4, (2014).
- A.O. Holmes, **C. Yang**, M. Patel, K. Savaram, H. He, V.V. Yakovlev, and A.A. Zozulya, “Microwave-enabled production of solution- processable graphene: principles and techniques of macroscopic modeling,” In: *14th International AMPERE Conference on Microwave and High Frequency Heating*, Nottingham, UK (2013).
- A.O. Holmes, **C. Yang**, and V.V. Yakovlev, “Temperature modeling for process control in microwave-assisted chemistry,” In: *IEEE Microwave Theory and Techniques Society Microwave Symposium Digest*, Seattle, WA (2013).
- **C. Yang** and V.V. Yakovlev, “Computation of microwave-induced temperature in liquid cylindrical reactants,” In: *47th International Microwave Power Institute Microwave Power Symposium*, pp. 105-107, Providence, RI, (2013).
- **C. Yang** and V.V. Yakovlev, “A simple model of microwave-induced heat transfer in cylindrical reactants with strong convection,” In: *International Conference on Heating by Electromagnetic Sources*, Padua, Italy, (2013).

*Undergraduate mentee

Other Reports and Articles

- L. Hebert-Dufresne, **V.C. Yang**, Misinformation about an outbreak like Covid-19 is important public health data, *STAT News* (2020), online at: <https://www.statnews.com/2020/04/07/misinformation-outbreak-is-important-public-health-data/>
- **V.C. Yang**, Visualizing the US Congress, interactive visualization in d3 (2016), online at http://www.vcyang.com/vis_congress/.
- **C. Yang**, Thermal Modeling of Wire-coil Insert, project report submitted to Argonne National Laboratory (2012).
- **C. Yang**, J. L. Skorinko, Does having a foreign accent affect men and women differently? Effect of foreign accent and gender on employment decisions and negotiations, project report submitted to Worcester Polytechnic Institute (2012).

Invited Presentations

- “Using mathematics to understand the American political landscape,” Sept 2020, Forthcoming talk at the SFI Applied Complexity Network to company representatives
- “Dynamical system modeling for the formation of social categories,” Nov 2019 talk at University of Chicago, Dept. of Sociology, Chicago, IL
- “Dynamical system models applied to social phenomena,” lecture at the SFI Complex Systems Summer School, Santa Fe, NM June 2019
- “Collective decision making,” presentation and panel discussion at April 2019 SFI Applied Complexity meeting on search and decisions at Google Ventures, Mountain View, CA
- “The search for simplicity in complex cities,” Transforming cities mini-course, March 2019 Carnegie Mellon University and University of Pittsburg, Pittsburg, PA
- “A ‘satisficing’ dynamical model for political elections,” talk at the Feb 2019 American Marketing Association Meeting, Austin, TX
- Guest lecture at the Northwestern University Undergraduate Math Society Nov 2016

Selected Contributed Presentations

- Talk at ACM Collective Intelligence Conference June 2020
- Poster at International Conference on Computational Social Science June 2020
- Talk at Dynamics Days US, Hartford CT Jan 2020
- Talk at Data Science Research Day, Northwestern University June 2018
- Poster at SIAM Conference on Applications of Dynamical Systems, Snowbird UT (The Red Sock Award for Best Poster Presentation) May 2017
- Talk at Chicago Area SIAM Student Conference, Evanston IL April 2017
- Talk at Seven Minutes of Science Symposium (science outreach), Evanston IL April 2017 (Video: <https://youtu.be/Xs5ewFzNSYI>)
- Poster at International Conference on Computational Social Science, Evanston IL June 2016
- Poster at Dynamics Days US, Durham NC Jan 2016
- Talk at IEEE Microwave Theory and Technique International Symposium, Tampa FL June 2014
- Talk at International Microwave Power Institute Symposium, Providence RI. June 2013 (First Place, Student Paper Competition)

- Talk at IEEE Student Conference, Cambridge MA April 2013
(Second Place, IEEE Student Paper Competition)
- Poster at New England Psychological Association Annual Conference, Worcester MA Oct 2012

Teaching

- Lecturer, Complex Systems Summer School, Santa Fe Institute 2019
Design and conduct lecture for interdisciplinary student body, including graduate students, post-docs, faculty, and industry representatives from a wide range of disciplines.
- Guest Lecturer, Transforming Cities Mini-course, 2019
Carnegie Mellon University and University of Pittsburg
Design and conduct lecture for interdisciplinary course. Students include graduate and undergraduate students of all majors.
- Teaching Certificate Program, Northwestern University 2016 - 2017
Complete semester-long program for learning good teaching practices
- Invited lecturer, Northwestern University Undergraduate Math Society 2016
Invited by undergraduate student club. Design and conduct lecture. Students are undergraduate math majors or prospective math majors.
- Teaching Assistant, Dept. of Mathematics, Northwestern University 2014–2018
Design and lead recitation sessions for undergraduate math courses, including calculus and linear algebra. Grade exams and tutor students.
- Argentine Tango Instructor, NuTango, Northwestern University 2016
Design and lead weekly dance classes, focus on relaxing gender norm in dance.
- Teaching Assistant, Dept. of Mathematics, WPI 2011 - 2013
Design and lead recitation sessions for undergraduate math courses, including calculus and differential equations.

Students supervised

Undergraduate

- Kate Tanha (Minerva Schools at KGI), REU student at SFI 2020
Computational text analysis for immigration narratives in minority newspapers
- Bronwynn Woodsworth (St Olaf College), REU student at SFI 2020
Computational text analysis of metaphor use on Mexican immigrants in US newspapers
- Elisa Heinrich Mora (Minerva Schools at KGI), REU student at SFI 2019–present
Computational modeling of inequality and segregation in urban areas
- Jacob Jackson (Brown University), REU student at SFI 2019–2020
Study the effect of global connectivity on socio-economic outputs of cities using the urban scaling framework
- Andria Tattersfield (Claremont McKenna College), REU student at SFI 2019
Detecting urban community structures using Yelp data
- Louisa Lee and Siyu Zhang (Northwestern University) 2016
REU students at Northwestern University
Publication “Do the two parties represent the US? Clustering political ideology of the US public,” in *SIAM Undergraduate Research Online*

Highschool

- Harvey McGuinness (Santa Fe High School) 2019–present
Modeling opinion dynamics in a population of mixed decision-making types

Leadership

- Co-organizer of Minisymposium, SIAM Conference on Dynamical Systems 2021 2020
- Founder and organizer, Around Science Discussion Group, SFI 2020
Organize discussion groups focused on big questions facing academic life. Topics include how to promote work-life balance in academia, and scientists' role in society.
- Organizer, Inaugural NICO Research Jam 2018
Organize event for seeding new interdisciplinary research collaborations at Northwestern Institute for Complex Systems
- Chair of Organizing Committee, Chicago Area SIAM Student Conference 2017
Lead team from 3 universities to organize and raise funds for conference of around 100 participants. Goal is to bridge the lack of communication among students using similar math techniques in different fields.
- Chapter President, Society for Industrial and Applied Mathematics 2016 - 2017
- Executive Board, Graduate Leadership and Advocacy Council, Northwestern University 2016 - 2017
- Co-founder and President, NuTango Northwestern 2015 - 2017
Found student group for inclusive community through Argentine Tango dance, focus on relaxing gender norms in partner dancing.
- Chapter President, Pi Mu Epsilon US Honorary National Math Society 2012 - 2013

Science Outreach

- Activity leader, Julia Robinson Mathematics Festival, Santa Fe, NM 2020
- Volunteer, InterPlanetary Festival, Santa Fe, NM 2019
- Judge, Northwestern University High School Project Showcase, Evanston IL 2017-2018
- Speaker, Seven Minutes of Science Symposium, Evanston IL 2017
- Volunteer, Grand Prix Challenges, Evanston 5th Ward Middle School, Evanston IL 2016

Referee Service

- *Chaos: An Interdisciplinary Journal of Nonlinear Science* 2016, 2017, 2020