

Vicky Chuqiao Yang

Omidyar Fellow and Peters Hurst Scholar, Santa Fe Institute, Santa Fe, NM 87501
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EDUCATION

- 2018 **Ph.D. Applied Mathematics**
Northwestern University, Evanston, IL
Advised by Daniel M. Abrams
Dissertation: Mathematical Models of Social Systems with Applications to
Urban Scaling Laws and Political Party Polarization
- 2014 **M.S. Applied Mathematics**
Northwestern University
- 2013 **B.S. Mathematical Sciences; B.S. Physics**
Worcester Polytechnic Institute (WPI), Worcester, MA
with high distinction

ACADEMIC APPOINTMENTS

- 2018–
present **Santa Fe Institute** (SFI), Santa Fe, NM
Omidyar Fellow and Peters Hurst Scholar (independent research position)
- 2014–2018 **Northwestern University**, Evanston, IL
Teaching and Research Assistant
- 2010–2012 **Worcester Polytechnic Institute**, Worcester, MA
Research Assistant, Social Psychology Inquiry Lab

INDUSTRY APPOINTMENTS

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

GRANTS

- 2021–2025 **National Science Foundation: Rule of Life: Emergent Networks**
“Towards a unified theory of regulatory functions and networks across biological and
social systems.” \$2,199,383. H. Youn (PI, Northwestern Kellogg), **V.C. Yang** (co-PI),
C.P. Kempes, S. Redner, G.B. West (co-PIs, SFI)
- 2021–2024 **National Science Foundation: Decision, Risk, and Management Sciences**
“Understanding the effect of individual decision-making strategies on collective
decision outcomes.” \$476,231. **V.C. Yang** (PI), J.L. Skorinko (co-PI, WPI), A.
Harutyunyan (co-PI, Sunwater Institute).

PUBLICATIONS

Peer-reviewed Journal Articles

- 2021 **V.C. Yang**, M. Galesic, H. McGuinness*, A. Harutyunyan “Dynamical-system model predicts when social learners impair collective performance,” *Proceedings of the National Academy of Sciences* 118(35). [[Video summary](#)]
- 2021 E.H. Mora*, C. Heine*, J.J. Jackson*, G.B. West, **V.C. Yang**, C.P. Kempes “Scaling of urban income inequality in the USA,” *Journal of the Royal Society Interface* 18:20210223.
- 2021 **V.C. Yang**, T. van der Does, H. Olsson, “Falling through the cracks: A dynamical model for the formation of social category boundaries,” *PLoS ONE* 16(3): e0247562.
- 2020 **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), 646–65.
- 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.
- 2019 **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. DOI: 10.1137/17S016518.
- 2017 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.
- 2015 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.
- 2013 **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.

Other Reports and Articles

- 2021 **V.C. Yang**, “Collective intelligence as infrastructure for reducing broad existential risks,” *Effective Altruism Forum*. [[link](#)]
- 2020 L. Hebert-Dufresne, **V.C. Yang**, “Misinformation about an outbreak like COVID-19 is important public health data,” *STAT News*. [[link](#)]
- 2016 **V.C. Yang**, “Visualizing the US Congress,” interactive data visualization in d3, online at www.vcyang.com/vis_congress/.

* Undergraduate mentee

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.

SELECTED MEDIA COVERAGE OF RESEARCH

2021 **PNAS News Feature** article “Modeling the power of polarization,” quotes me on political polarization. [[link](#)]

2021 **SIAM News** article, “Social learners impact outcome of group decision-making,” reports on my research of collective decision-making. [[link](#)]

2021 **BigThink** article, “Math explains polarization, and it’s not just about politics,” reports on my research of social categories. [[link](#)]

2020 **Forbes** article, “This is the reason American politics are so polarized,” reports at length about my work on political party polarization. [[link](#)]

2020 **Wall Street Journal** article, “Social media is so good at polarizing us,” discusses my work on political party polarization. [[link](#)]

2020 **Complexity Podcast** [[audio link](#)]

2020 **KTRC Talk Radio**, The Richard Eeds Show

INVITED PRESENTATIONS

Nov 2021 Guest speaker, Mathematics of Democracy course, Harvey Mudd College

Oct 2021 Seminar speaker, Center for the Study of Complex Systems, University of Michigan

Sept 2021 Colloquium speaker, Dept. of Computer Science, University of New Mexico

June 2021 “Scaling of income inequality in the United States,” talk and panel discussion, SFI Applied Complexity Network to corporate representatives

Sept 2020 “Using mathematics to understand the American political landscape,” talk at SFI Applied Complexity Network to corporate representatives

Nov 2019 “Dynamical-system modeling of the formation of social categories,” seminar at University of Chicago, Dept. of Sociology, Chicago, IL

June 2019 “Dynamical system models applied to social phenomena,” guest lecture at SFI Complex Systems Summer School, Santa Fe, NM

April 2019 “Collective decision-making,” presentation and panel discussion at SFI Applied Complexity meeting on search and decisions at Google Ventures, Mountain View, CA

March 2019 “The search for simplicity in complex cities,” Transforming Cities mini-course, Carnegie Mellon University and University of Pittsburgh, Pittsburgh, PA

Feb 2019 “A ‘satisficing’ dynamical model for political elections,” talk at the American Marketing Association Meeting, Austin, TX

Nov 2016 Guest lecture at the Northwestern University Undergraduate Math Society

SELECTED CONTRIBUTED PRESENTATIONS

July 2021 Virtual presentation at International Conference on Computational Social Science

May 2021 Virtual presentation at SIAM Conference on the Application Dynamical Systems

June 2020 Virtual presentation at ACM Collective Intelligence Conference [[Video](#)]

Jan 2020 Talk at Dynamics Days US, Hartford CT

June 2018 Talk at Data Science Research Day, Northwestern University

May 2017 Poster at SIAM Conference on Applications of Dynamical Systems, Snowbird UT (The Red Sock Award for Best Poster Presentation)

April 2017 Talk at Chicago Area SIAM Student Conference, Evanston IL

April 2017 Talk at Seven Minutes of Science Symposium (science outreach), Evanston IL

June 2016 Poster at International Conference on Computational Social Science, Evanston IL

Jan 2016 Poster at Dynamics Days US, Durham NC

June 2013 Talk at International Microwave Power Institute Symposium, Providence RI (First Place, Student Paper Competition)

April 2013 Talk at IEEE Student Conference, Cambridge MA (Second Place, IEEE Student Paper Competition)

Oct 2012 Poster at New England Psychological Association Annual Conference, Worcester MA

AWARDS, HONORS, AND FELLOWSHIPS

2018 Omidyar Fellowship, Santa Fe Institute

2018 Grand Prize in Interactive Data Visualization, Northwestern University Computational Research Day

2017 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

2016 Integrated Data Science Traineeship, Northwestern University

2013 Provost's Major Qualifying Project Award, WPI

2009 WPI Presidential Scholarship

TEACHING EXPERIENCE

2021–present Instructor, “Practical introduction to data science,” online open course, Complexity Explorer, SFI

2021 Lead instructor, Undergraduate Complexity Researcher Program, SFI

2019 Lecturer, Complex Systems Summer School, SFI

2019 Guest Lecturer, Transforming Cities Mini-course, Carnegie Mellon University and University of Pittsburgh

2016–2017 Teaching Certificate Program (teaching training), Northwestern University

2016 Invited guest lecturer, Northwestern University Undergraduate Math Society

2014–2015, 2017 Teaching Assistant, Dept. of Mathematics, Northwestern University

2016 Argentine Tango Dance Instructor, Argentine Tango Club, Northwestern University

2011–2013 Teaching Assistant, Dept. of Mathematics, WPI

LEADERSHIP

2021 Co-organizer of minisymposium “Modeling Collective Behavior in Human Social Systems,” SIAM Conference on Dynamical Systems

2020–2021 Founder and organizer, “Around Science” Discussion Group, SFI

2018 Organizer, Inaugural NICO Research Jam

2017 Chair of Organizing Committee, Chicago Area SIAM Student Conference

2016–2017 Chapter President, Society for Industrial and Applied Mathematics

2016–2017 Executive Board, Graduate Leadership and Advocacy Council, Northwestern University

2015–2017 Co-founder and President, Argentine Tango Club, Northwestern University

2012–2013 Chapter President, Pi Mu Epsilon US Honorary National Math Society

SCIENCE OUTREACH

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

REFEREE AND JUDGE SERVICE

- 2021 Judge for the Red Sock Award for Best Poster Presentation,
SIAM Conference on Dynamical Systems
- 2021 Referee for grant proposal, NSF: Human Networks and Data Science
- 2021 Referee for journals
Science Advances
Crime Science
Chaos: An Interdisciplinary Journal of Nonlinear Science
- 2021 Referee for journals
PLOS ONE
Chaos: An Interdisciplinary Journal of Nonlinear Science
- 2017 Referee for journal Chaos: An Interdisciplinary Journal of Nonlinear Science
- 2016 Referee for journal Chaos: An Interdisciplinary Journal of Nonlinear Science