Vicky Chuqiao Yang

Peters Scholar and Omidyar Fellow, Santa Fe Institute

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Education

Ph.D. Applied Mathematics 2018
Northwestern University, Evanston, IL
Research focus: mathematical models of large-scale 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, Santa Fe, NM
Peters Scholar and Omidyar Postdoctoral Fellow 2018–present

Northwestern University, Evanston, IL
Research Assistant in Applied Mathematics 2014–2018

Argonne National Laboratory, Lemont, IL
Lee Teng Intern in Accelerator Physics 2012

Worcester Polytechnic Institute, Worcester, MA
Research Assistant, Social Psychology Inquiry Lab 2010–2012

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
- Travel Award, SIAM Conference on Applications of Dynamical Systems 2017
- Integrated Data Science (IDEAS) Traineeship, Northwestern University 2016
- Travel Award, Dynamics Days Conference 2015
- 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
- Stephen Salisbury Prize for Outstanding Seniors, WPI 2013

- Provost's Major Qualifying Project Award, WPI 2013
- WPI's Putnam Competition Top Scorer 2013
- WPI Summer Undergraduate Research Fellowship 2011
- WPI Presidential Scholarship 2009

Manuscripts in Preparation

- **V.C. Yang**, T. van der Does, H. Olsson, "Falling through the cracks: a dynamical model for the formation of social categories," in preparation.
- **V.C. Yang**, A.B. Kao, J. Flack, "Collective information processing systems: a review," in preparation.

Manuscripts Under review

- L.M.A. Bettencourt, **V.C. Yang**, J. Lobo, C. Kempes, D. Rybski, M. Hamilton, "The Interpretation of Urban Scaling Analysis in Time," under review. Preprint: `https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3459540`
- **V.C. Yang**, D.M. Abrams, G. Kernell, A.E. Motter, "Why are US parties so polarize? A 'satisficing' dynamical model," under review.

Peer-reviewed Publications in Journals

- **V.C. Yang**, A.V. Papachristos, D.M. Abrams, "The origin of urban-productivity scaling laws," *Physical Review E* 100, 032306 (2019). General audience talk video: `https://youtu.be/Xs5ewFzNSYI`
- L. Lee[1], S. Zhang[1], **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).

[1] Undergraduate mentee

- **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).

Other Reports and Articles

- **C. Yang**, Visualizing the US Congress, interactive visualization in d3, online at `http://www.vcyang.com/vis_congress/` (2016).
- **C. Yang**, Macroscopic Modeling of Microwave-enabled production of solution-processable grapheme, Major Qualifying Project Report submitted to Worcester Polytechnic Institute (2013).
- **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

- "Dynamical system models applied to social phenomena," lecture at the Santa Fe Institute Complex Systems Summer School, Santa Fe, NM — June 2019
- "Collective decision making," presentation and panel discussion at Santa Fe Institute Applied Complexity meeting on search and decisions, Google Ventures, Mountain View, CA — April 2019
- "The search for simplicity in complex cities," Transforming cities mini-course, Carnegie Mellon University and University of Pittsburg, Pittsburg, PA — March 2019
- "A 'satisficing' dynamical model for political elections, " talk at American Marketing Association meeting, Austin, TX — Feb 2019
- Guest lecture at the Northwestern University Undergraduate Math Society — Nov 2016

Selected Contributed Presentations

- Poster at Dynamics Days US, Evanston IL — Jan 2019
- Talk at Data Science Research Day, Northwestern University — June 2018
- Poster at SIAM Conference on Applications of Dynamical Systems, Snowbird UT — May 2017 (The Red Sock Award for Best Poster Presentation)
- Talk at Chicago Area SIAM Student Conference, Evanston IL — April 2017
- Talk at Seven Minutes of Science Symposium (science out reach), 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

Mentoring

- Jacob Jackson (Brown University), REU at Santa Fe Institute — 2019
  Studying the effect of global connectivity on socio-economic outputs of cities.
- Elisa Heinrich Mora (Minerva Schools at KGI), REU at Santa Fe Institute — 2019
  Computational modeling of inequality and segregation in urban areas.
- Andria Tattersfield (Claremont McKenna College), REU at Santa Fe Institute — 2019
  Detecting urban community structures using Yelp data.
- Louisa Lee and Siyu Zhang (Northwestern University), REU's at Northwestern University — 2016
  Publication "Do the two parties represent the US? Clustering political ideology of the US public, " in *SIAM Undergraduate Research Online*.

Teaching

Lecturer, Complex Systems Summer School, Santa Fe Institute — 2019
Lecturer, Transforming Cities Mini-course, — 2019
Carnegie Mellon University and University of Pittsburg
Teaching Certificate Program, Northwestern University, — 2016 - 2017
Teaching Assistant, Dept. of Mathematics, Northwestern University — 2014 - 2015, 2016 - present
Argentine Tango Instructor, NuTango, Northwestern University — 2016
Teaching Assistant, Dept. of Mathematics, WPI — 2011 - 2013

Leadership

Organizer, Inaugural NICO Research Jam — 2018
Organize the first research jam event at Northwestern Institute for Complex Systems
Chapter President, Society for Industrial and Applied Mathematics — 2016 - 2017

Chair of Organizing Committee, Chicago Area SIAM Student Conference — 2017
Lead 9-person team from 3 universities to organize and raise funds for conference of 100 participants. Goal is to of bridge the lack of communication among students using similar math techniques but are in different fields.

Co-founder and President, NuTango Northwestern — 2015 - 2017
Found non-profit student group for inclusive community through Argentine Tango dance, focus on challenging gender norms in partner dancing. Define organization mission and execute decisions. Lead teams of 2-7 exec members and raise funds. Grow group from 2 to 450 members.

Executive Board Member,
Graduate Leadership and Advocacy Council, Northwestern University — 2016 - 2017

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

Science Outreach

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

Industry Experience

Data Scientist Internship, **Airbnb**, San Francisco, CA 2017

Referee Service

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