Joel Nishimura

CONTACT INFORMATION	Arizona State University at the West Campus Mail Code: 2352 P.O. Box: 37100 Phoenix, AZ 85069-7100	*E-mail:* joel.nishimura@asu.edu *Fax:* (602) 543-6073 *Tel:* (602) 543-3912

AREAS OF INTERESTS

Dynamical systems, Large Scale Networks, Decentralized Emergent Properties, Mathematical Biology

EDUCATION

Cornell University, Ithaca, New York   August 2007 – August 2013

- Ph.D. student in Applied Mathematics
- M.S. in Computer Science
- Advisor: Prof. Eric Friedman

University of Washington, Seattle, Washington   August 2003 – May 2007

- B.S. in Mathematics, with College Honors, Magna Cum Laude
- Undergraduate Advisor: Prof. Nathan Kutz
- The UW President's Freshman Medalist for 2003-2004

ACADEMIC POSITIONS

Arizona State University   School of Mathematical and Natural Sciences
Assistant Professor   August 2013 –present

PUBLICATIONS

In Print

M. Herrera[†], A. Miller[†] and J. Nishimura. "Altruistic aging: the evolutionary dynamics balancing longevity and evolvability" *Mathematical Biosciences Engineering* **14**, (2017), 455-465.

J. Nishimura. "Frequency adjustment and synchrony in networks of delayed pulse-coupled oscillators" *Physical Review E* **91** (2015).

J. Nishimura and J. Ugander. "Restreaming graph partitioning: simple versatile algorithms for advanced balancing" *Proceedings of the 19th ACM SIGKDD Conference on Knowledge Discovery and Data Mining (KDD)* (2013). [Also listed under conferences]

J. Nishimura and E. J. Friedman. "Probabilistic convergence guarantees for type-II pulse-coupled oscillators" *Physical Review E: Rapid Communications* **86** (2012).

J. Nishimura and E. J. Friedman. "Robust convergence in pulse coupled oscillators with delays" *Physical Review Letters* **106** (2011).

J. Nishimura and N. Kutz. "Stability and interactions of transverse field structures in optical parametric oscillators near resonance detuning." *Journal of Physics B* **41** (2008).

(†) - supervised undergraduate students

In Press

B. Fosdick*, D. Larremore*, J. Nishumura*, J. Ugander*. "Configuring random graph models with fixed degree sequences" *SIAM Review* (2018).

(*) - these authors contributed equally

In Submission

J. Nishimura, R. Smith[†], K. Jensen, G. Ankley and K. Watanabe. "Estimating Intermittent Individual Spawning Behavior via Disaggregating Group Data" *Bulletin of Mathematical Biology.*

J. Nishimura, "The connectivity of graphs of graphs with self-loops and a given degree sequence" *Journal of Complex Networks.*

(†) - supervised undergraduate students

CONFERENCES

"A Model of Intergenerational Wealth Dynamics and Intergenerational Wealth Traps," SIAM Conference on Applications of Dynamical Systems, Snowbird, UT, May 2017.

"Cooperative Aging: The Evolutionary Dynamics Balancing Longevity and Evolvability," SIAM Life Sciences, Boston, MA, July 2016.

"The Familiarity Curve of the Slow Flashcard System, " AMS Joint Mathematics Meetings, San Antonio, TX, January 2015.

"Searching for Pulse Coupled Oscillator Synchronization with a Genetic Algorithm," Joint Annual Meeting of JSMB/SMB, Osaka, Japan, July 2014.

"Restreaming Graph Partitioning: Simple Versatile Algorithms for Advanced Balancing," ACM SIGKDD international conference on Knowledge discovery and data mining, Chicago, IL, August 2013.

"Designing Pulse Coupled Oscillators," SIAM Conference on Applications of Dynamical Systems, Snowbird, UT, May 2013.

"The Probability of Synchronization in Pulse Coupled Oscillators with Time Delay," Dynamics Days, Baltimore, MD, January 2012.

"Robust Convergence of Pulse-Coupled Oscillators on Networks with Delays," Network Frontier Workshop, Evanston, IL, December 2011.

WORKSHOPS

AMS Mathematics Research Community: Network Science, June 2014.

Carnegie Mellon: Summer School on Algorithmic Economics, August 2012.

AWARDS AND HONORS

- NSF IGERT Fellowship   2007-2009
- Phi Beta Kappa   Elected 2007
- The UW President's Freshman Medalist   2003-2004
- DeEtte McAuslan Stuart Scholarship   2003-2007

COURSES TAUGHT

- *MAT 472: Intermediate Real Analysis.* Introduces analysis in metric spaces with emphasis on the real line. Prerequisites: MAT 371.
- *MAT 419: Introduction to Linear Optimization.* Simplex method, duality, and network flows. Applications to game theory, geometry, combinatorics, and graph theory. Prerequisites: CSE 100, MAT 300 & 342.
- *MAT 411: History and Philosophy of Mathematics.* Covers the history of mathematics since ancient times: the ideas, the context and the different philosophical perspectives of mathematics.
- *MAT 350: Techniques and Applications of Applied Mathematics.* Survey of common techniques in Epidemiology, Linear Programming, Network Science and Financial Math. Prerequisites: MAT 300 & 242.

- *MAT 275: Modern Differential Equations.* Prerequisites: MAT 271.
- *MAT 272: Calculus with Analytic Geometry III.* Prerequisites: MAT 271.

UNDERGRADUATE MENTORING	Supervised 14 students for a total of 63 credit hours of capstone and/or independent study. Project titles include:

- Modeling Social and Lunar Coordination in Killifish Reproduction.
- Modeling Killifish Fecundity.
- Cooperative Aging: The Evolutionary Dynamics Balancing Longevity and Evolvability.
- Rock Paper Scissors Gun, a Nontransitive Game Prediction Model.
- Pulse Coupled Oscillators and the Sino Atrial Node.
- Improvements on Restreaming Graph Partitioning.
- Frequency Adjustment and Oscillator Synchronization.
- Pulse Coupled Phase-Frequency Oscillator Networks with Stochastic Delays.

*In accordance with FERPA regulations, student names have been censored.

SERVICE

- Reviewed articles for: SIAM Journal of Applied Math, SIAM Journal on Applied Dynamical Systems, Transactions on Big Data, SIAM Undergraduate Research Online, EPJ Data Science, Journal of Complex Networks, Journal Mathematical Biosciences and Engineering, International World Wide Web Conference (WWW-15), Annals of Combinatorics, IEEE Transactions on Knowledge and Data Engineering, IEEE Transactions on Mobile Computing, IEEE Transactions on Neural Networks and Learning Systems, Physica D, Physics Letters A.
- Program Committee member: Tenth & Eleventh International AAAI Conference on Web and Social Media (ICWSM-16) and (ICWSM-17)
- Co-organizer of the 2015 and 2016 ASU Sonya Kovalevsky High School Mathematics Day.
- Co-Organizer of Applied & Computational Mathematics Seminar Series, 2014
- Co-Facilitator of the Adhoc Applied Mathematics Curriculum Committee, 2014
- Member of the ASU New College Summer Common Reading Committee, 2014-2015.
- Member of ASU New College Web Steering Committee, 2013.
- Member of the ASU New College Curriculum Reboot Committee, 2015.
- Co-director/founder of the Diversity Program in Math: Mentoring program, 2012-2013.
- Instructor at Johns Hopkins Center for Talented Youth Odyssey Series. Presented a presentation on coupled oscillators for 7th-10th graders and their parents, October 2009.

PROFESSIONAL ORGANIZATIONS

SIAM, Society for Industrial and Applied Mathematics: 2013 – Present

SMB, Society for Mathematical Biology: 2014 – Present

AMS, American Mathematical Society: 2014 – Present