

Curriculum Vitæ

Victor Amelkin

Warren Center Postdoctoral Fellow

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The *central theme of my research is network science*, with an emphasis on *social and economic networks*, studied from the perspectives of analysis, modeling, and control. My work is highly interdisciplinary, spanning applications and methods from computer science (algorithms, data mining, applied machine learning); engineering (dynamical systems, matrix theory); economics, management science, and operations research (game theory, probability, optimization); and computational social science (socio-psychological models). The *specific research topics* I have worked on include

- ◇ analysis and modeling of competing opinion formation in social networks;
- ◇ strategic formation and resilience of supply chain networks;
- ◇ resilience of online social networks to external control;
- ◇ modeling uncertain financial networks in the presence of economic shocks;
- ◇ analysis of collective performance of networked teams.

CURRENT ACADEMIC APPOINTMENT

07/2018– ... Warren Center Postdoctoral Fellow
[Warren Center for Network & Data Sciences](#)
Department of Electrical & Systems Engineering
University of Pennsylvania
Hosts: Rakesh V. Vohra, George J. Pappas, Victor M. Preciado

EDUCATION

09/2011–06/2018 PhD, Computer Science, University of California, Santa Barbara, CA, US
Thesis: “Analysis, Modeling, and Control of Dynamic Processes in Networks”
Research Advisor: [Ambuj K. Singh](#)
Doctoral Committee: [Ambuj K. Singh](#), [Francesco Bullo](#), [John R. Gilbert](#), [Xifeng Yan](#)

09/2006–06/2008 MSc, Applied Mathematics and Computer Science, [Tula State University](#), Tula, Russia
Thesis: “Fejér Problem for Polynomials on a Sphere”
Research Advisor: [Valeriy Ivanov](#)

09/2002–06/2006 BSc, Applied Mathematics and Computer Science, [Tula State University](#), Tula, Russia

PUBLICATIONS IN REFEREED JOURNALS AND CONFERENCE PROCEEDINGS

- [1] AMELKIN, V., SINGH, A.K., “*Fighting Opinion Control in Social Networks via Link Recommendation*” // In Proc. of ACM Conference on Knowledge Discovery and Data Mining (KDD), August, 2019, (acceptance rate 14.2%), [\[pdf\]](#), [\[doi\]](#), [\[supplement\]](#), [\[poster\]](#), [\[slide\]](#), [\[video\]](#).
- [2] AMELKIN, V., BOGDANOV, P., SINGH, A.K., “*A Distance Measure for the Analysis of Polar Opinion Dynamics in Social Networks (Extended Paper)*” // ACM Trans. on Knowledge Discovery from Data (TKDD), 13(4), 2019, [\[pdf\]](#), [\[doi\]](#), [\[slides\]](#), [\[code\]](#).
- [3] AMELKIN, V., BULLO, F., SINGH, A.K., “*Polar Opinion Dynamics in Social Networks*” // IEEE Transactions on Automatic Control (TAC) (61) 11, 2017, [\[pdf\]](#), [\[doi\]](#), [\[poster\]](#), [\[slides\]](#).
- [4] AMELKIN, V., ASKARISICHANI, O., KIM Y.J., MALONE T.W., SINGH, A.K., “*Dynamics of Collective Performance in Collaboration Networks*” // PLOS ONE 13(10), 2018, [\[pdf\]](#), [\[doi\]](#), [\[data\]](#), [\[supplement\]](#).
- [5] AMELKIN, V., BOGDANOV, P., SINGH, A.K., “*A Distance Measure for the Analysis of Polar Opinion Dynamics in Social Networks*” // In Proc. of IEEE International Conference on Data Engineering (ICDE), May, 2017, (acceptance rate 17.7%), [\[pdf\]](#), [\[doi\]](#), [\[poster\]](#), [\[slides\]](#), [\[code\]](#).

WORKING PAPERS

- [6] AMELKIN, V., VENKATESH S., VOHRA R., “*Structure and Dynamics of Contagion in Financial Networks with Implications for Systemic Risk*” // In Preparation, January, 2020.
- [7] AMELKIN, V., VOHRA R., “*Strategic Formation and Reliability of Supply Chain Networks*” // Submitted in September, 2019; revised in January, 2020, [\[pdf\]](#), [\[arxiv\]](#).
- [8] AMELKIN, V., VOHRA R., “*Yield Uncertainty and Strategic Formation of Supply Chain Networks*” // Submitted in July, 2019; under revision, January 2020, [\[pdf\]](#), [\[arxiv\]](#).

WORKSHOPS, PRESENTATIONS, THESES, TECHNICAL REPORTS

- [9] AMELKIN, V., “*Analysis, Modeling, and Control of Dynamic Processes in Networks*” // PhD Thesis, University of California, Santa Barbara, June, 2018, [\[pdf\]](#).
- [10] AMELKIN, V., SINGH, A.K., “*Dynamics of Opinions and Social Power in Complex Social Networks*” // Presentation, UC Santa Barbara, January, 2018, [\[poster\]](#).
- [11] AMELKIN, V., UZZI, B., NG, J., SINGH, A.K., “*Performance-driven Collaboration Among Stock Traders*” // Presentation, UC Santa Barbara, January, 2018, [\[poster\]](#).
- [12] AMELKIN, V., BULLO, F., SINGH, A.K., “*Polar Opinion Dynamics in Social Networks*” // 32’nd Southern California Control Workshop, Caltech, April, 2017, [\[slides\]](#).
- [13] AMELKIN, V., ASKARISICHANI, O., SINGH, A.K., KIM Y.J., MALONE T.W., “*Dynamics of Collective Performance in Collaboration Networks*” // INSNA International Sunbelt Social Network Conference (Sunbelt), Newport Beach, CA, April, 2016, [\[slides\]](#).
- [14] AMELKIN, V., NG, E.G., “*Parallel Communication Analysis for Sparse Cholesky Factorization Algorithms*” // Tech. Report. Lawrence Berkeley National Laboratory, 2012, [\[pdf\]](#).
- [15] AMELKIN, V., “*Fejér Problem for Polynomials on a Sphere*” // MSc Thesis, Tula State University, 2008.

TEACHING

- 09/2015–09/2015 Instructor, UC Santa Barbara, US
 (grad.) Linear Algebra and Graphs, Spectral Clustering (Data and Network Science Bootcamp, Fall, 2015)
- 10/2012–09/2013 Teaching Assistant, UC Santa Barbara, US
 (ugrad.) Foundations of Computer Science (Summer, 2015; Spring-Summer, 2013)
 (ugrad.) Object-Oriented Design and Implementation in C++ (Summer, 2013; Fall, 2012)
 (grad.) Numerical Simulation (Numerical Methods for Solving ODEs and PDEs) (Winter, 2013)
- 09/2007–06/2008 Teaching Assistant, Tula State University, Tula, Russia
 (ugrad.) Assembly Language Programming

EMPLOYMENT HISTORY

- 07/2018– ... *Warren Center Postdoctoral Fellow*, University of Pennsylvania, Philadelphia, PA
- 06/2013–06/2018 *Graduate Student Researcher*, University of California, Santa Barbara, CA
- 06/2016–09/2016 *Research Scientist Intern*, Amazon, Inc., Seattle, WA
- 07/2014–09/2014 *Research Intern*, Technicolor Labs, Los Altos, CA
- 07/2012–09/2012 *Research Assistant*, Lawrence Berkeley National Lab, Berkeley, CA
- 10/2011–06/2012 *Graduate Student Researcher*, University of California, Santa Barbara, CA
- 10/2006–03/2010 *(Senior) Software Engineer*, DevExpress, Russia

GRANT PROPOSALS (SIGNIFICANT CONTRIBUTIONS ONLY)

- (awarded)** Defense Threat Reduction Agency, HDTRA1-19-1-0017, “Inferring Network Structure and Flows Using Partial Observations”, UCSB/ARL, A.K. Singh (PI), F. Bullo (Co-PI), \$1.4M, 5/14/19-6/2/22
- (under review)** Amazon Research Award in OR and Optimization, “Decentralized Resilient Supply Chain Networks”, University of Pennsylvania, R. Vohra (PI), V. Amelkin (non-PI), \$80K, submitted on 10/4/2019.

PROFESSIONAL SERVICE

- I serve on the Editorial Board of [The Journal of Mathematical Sociology](#) ('18-...).
- I organize the weekly [Computer Science Theory Seminar](#) at the University of Pennsylvania ('18-...).
- I have served as a reviewer for a number of computer science, engineering, economics, and sociology conferences, journals, and publishers, including
- (CS) KDD'18'17'16'15, WWW'18'17, SDM'17'16, ICDM'16'13, WSDM'16, SIGMOD'14, TKDE'18'17'15'14, TNSE'18'17, DMKD'19, AAAI'17'16, ECML-PKDD'14
- (Engr.) TAC'19'18, Automatica'20'19'18, CDC'19'17, ACC'18, ECC'19, Scientific Reports'18
- (Econ.) International Economic Review'19
- (Soc.) Journal of Mathematical Sociology'20'19'18
- (Books) Cambridge University Press'18

AWARDS

- 2011-2012 \$8,000 Merit Fellowship from the Department of Computer Science at the UCSB
- 2011 \$1,500 Opportunity Grant from the US Department of State
- 2008 Best paper at the Conf. on Current Problems in Mathematics, Mechanics, and Computer Science; Russia
- 2002 Tula Region Olympiad in Applied Mathematics for high-school students, 2nd prize

REFERENCES

Rakesh V. Vohra

George and Lydia Bravo Weiss University Professor
Director, [Warren Center for Network & Data Sciences](#)
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Ambuj K. Singh (PhD Advisor)

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