

Isaac S. Klickstein, Ph.D.
Control Systems, Applied Mathematics, Complex Networks
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Professional Summary

Recent PhD graduate; specialized in controls engineering and network science with a strong background in optimization and software development. Expertise includes numerical methods, graph theory, continuous and discrete optimization, and optimal control.

Software & Programming Skills

Programming: C/C++, Fortran (77 and modern), Matlab/GNU Octave, Python, Bash

Version Control: Git, Subversion

Optimization: Coin-OR (Ipopt, CLP, CBC), GLPK, *PSOPT*

Simulation: ANSYS, Solidworks, OpenFOAM

Documentation: L^AT_EX, markdown, html/css, doxygen

Work History

Research Assistant, 10/2015 - 09/2020

Department of Mechanical Engineering - University of New Mexico

- Conducted research projects that have resulted in publications in journals such as Nature Communications and Physical Review Letters
- Developed software related to applied optimal control, synchronization of multi-agent systems and control of networked systems

Teaching Assistant, 08/2015 - 12/2015

Department of Mechanical Engineering - University of New Mexico

- Lead labs that taught students machining skills and best practices
- Supervised student machine shop; managed and maintained inventory

Technical Specialist (Student), 10/2014 - 05/2015

Department of Mechanical Engineering - University of New Mexico

- Developed software and simulations for networked robotic agents

Management Experience

Subteam Manager (5 person team), 08/2014 - 05/2015

LOBOMotorsports (Formula SAE) - University of New Mexico

- Co-designed and manufactured brakes and wheels subsystem for 2015 vehicle
- Co-developed brake dynamics code in MATLAB with GUI in Java
- Maintained version controlled design iterations in Solidworks and ANSYS

Education

Ph.D., Mechanical Engineering, University of New Mexico, Albuquerque, 2020

Bachelor of Science, Mechanical Engineering, University of New Mexico, Albuquerque, 2015

Publications

- **Klickstein, I.**, Shirin, A., & Sorrentino F. (2017). Energy scaling of targeted optimal control of complex networks. *Nature communications*, 8, 1514. [Online](#)
- Shirin, A., **Klickstein, I.**, & Sorrentino F. (2017). Optimal control of complex networks: Balancing accuracy and energy of the control action. *Chaos: An Interdisciplinary Journal of Nonlinear Science*, 27(4), 041103. [Online](#)
- **Klickstein I.**, Shirin A., & Sorrentino F. (2017). Locally optimal control of complex networks. *Physical review letters*, 119(26), 268301. [Online](#)
- **Klickstein I.**, Kafe I., Bartaula S., & Sorrentino F. (2018). Energy scaling with control distance in complex networks. In *Circuits and Systems (ISCAS), 2018 IEEE International Symposium on* (pp. 1-5). IEEE. [Online](#)
- Kafe, I., Bartaula, S., Shirin, A., **Klickstein, I.**, Das, P., & Sorrentino, F. (2018). Optimal control of networks in the presence of attackers and defenders. *Chaos: An Interdisciplinary Journal of Nonlinear Science*, 28(5), 051103. [Online](#)
- **Klickstein, I.**, & Sorrentino, F. (2018). Control energy of lattice graphs. In *CDC 2018, IEEE Conference on Decision and Control*. [Preprint](#)
- **Klickstein, I.** & Sorrentino, F. (2018). Generating Graphs with Symmetry. *IEEE Transactions on Network Science and Engineering*. [IEEEExplore](#)
- **Klickstein, I.**, & Sorrentino, F. (2018). Control Distance and Energy Scaling of Complex Networks. *IEEE Transactions on Network Science and Engineering*. [IEEEExplore](#)
- Shirin, A., **Klickstein, I.**, Feng, S., Lin, Y.T., Hlavacek W., & Sorrentino F. (2019). Prediction of Optimal Drug Schedules for Controlling Autophagy. *Scientific Reports*, 9(1), 1428. [Online](#)
- Shirin, A., Della Rossa, F., **Klickstein, I.**, Russell, J.J., & Sorrentino, F. (2018). Optimal Regulation of Blood Glucose Level in Type I Diabetes using Insulin and Glucagon. *PloS one*, 14(3), e0213665 [Online](#).
- **Klickstein, I.** and Sorrentino F. (2018). Generating Symmetric Graphs. *Chaos: An Interdisciplinary Journal of Nonlinear Science*, 28(12), 121102 [Online](#).
- **Klickstein, I.**, Pecora L., and Sorrentino F. (2019). Symmetry Induced Group Consensus. *Chaos: An Interdisciplinary Journal of Nonlinear Science*, 29(7), 073101 [Online](#)
- Shirin, A., **Klickstein, I.**, and Sorrentino F. (2019). Stability Analysis of Reservoir Computes Dynamics via Lyapunov Functions. *Chaos: An Interdisciplinary Journal of Nonlinear Science*, 29(10), 103147 [Online](#)

- **Klickstein, I.**, & Sorrentino, F. (2020). The Controllability Gramian of Lattice Graphs. *Automatica* 114, 108833 [Online](#)
- Della Rossa, F., Pecora, L., Blaha, K., Shirin, A., **Klickstein, I.**, Sorrentino, F. (2020). Symmetries and cluster synchronization in multilayer networks. *Nature Communications* 11, 3179 [Online](#)

Presentations

- Presented *Control Energy of Lattice Graphs* at the IEEE Conference on Decision and Control 2018.
- Presented *Generating Graphs with Symmetries* at the Siam Conference on Applications of Dynamical Systems 2019.

Awards

Outstanding Graduate Student, Department of Mechanical Engineering, UNM, 2017
 Passed PhD defense with **distinction**, Department of Mechanical Engineering, UNM, 2020
Dissertation available [here](#)