

Justin Grana, Ph.D.

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PROFILE	An economist and game theorist specializing in modeling human behavior in complex environments with experience in the domains of computer network security, air traffic control, collusive cartel formulation and organizational structure.	
RELEVANT EXPERIENCE	Santa Fe Institute, <i>Graduate Student Researcher and Postdoctoral Researcher, Santa Fe, NM, 2014-Present</i> <ul style="list-style-type: none">▶ Formulated a within-perimeter computer network attack as a continuous-time hidden Markov model, derived a likelihood ratio attack detector and numerically demonstrated that the likelihood ratio based detector has a lower false alarm rate than a standard anomaly detector.▶ Modeled a computer network attack scenario as a general-sum game between an attacker and defender and then developed and implemented long short-term memory neural networks to solve for equilibrium optimal defense strategies.▶ Collaborated on a project that analyzed the incentives for a regulatory body to withhold computer network vulnerability information to be able to deceive malicious attackers.▶ Determined how firms' incentive to share information and cooperate is impacted by the rate at which they receive information in a continuous-time, event-driven game.▶ Published research in peer-reviewed journals and presented research at conferences, workshops and invited lectures. Institute of Spatial Economic Analysis <i>Economic Consultant, Redlands, CA, 2014-Present</i> <ul style="list-style-type: none">▶ Trained, tested and validated a feed-forward neural network using parallel computing techniques to forecast zip-code level employment in the United States.▶ Developed, tested and deployed a python script for automating data upload from a local source to a remote MS-SQL server. Google Summer of Code <i>Student Awardee, Remote Work, Summer 2011</i> <ul style="list-style-type: none">▶ Wrote and documented approximately 3000 lines of python code to perform empirical likelihood estimation and inference in python.▶ Developed a test suite and integrated test suite with 'nose' software.▶ Submitted pull requests via Github to the statsmodels repository and communicated with the package manager to ensure that the pull requests were merged with the master repository.	
EDUCATION	American University <i>Ph.D., Economics, July 2016</i> <i>Dissertation:</i> Behavior Based Cyber Security: Employing Tools from Traditional and Behavioral Game Theory to Improve Attack Detection Xavier University <i>B.S.B.A., Economics, B.A. Spanish, June 2010</i>	
FUNDING	<ul style="list-style-type: none">▶ Army Research Office Grant for "Event-Driven Game Theory for Predicting Dynamics of Social Systems" (2015-2018, \$468,804)▶ Info-Metrics Graduate Summer Fellowship (2014, \$5,000).▶ Arts and Science Fellowship, American University (2010-2014, Tuition Waver + \$19K/yr stipend)	
RELEVANT SKILLS	Game Theory, Econometrics, Statistics, Neural Networks, Machine Learning, Python, Julia, R, SAS, STATA, MATLAB, Unix, ArcGIS, SQL, Bash, Go, Mathematica, AWS, Github, TensorFlow	