

# Laila A. Wahedi

Email: [law98@georgetown.edu](mailto:law98@georgetown.edu)

Website: [Wahedi.us](http://Wahedi.us)

Portfolios: [github.com/lwahedi](https://github.com/lwahedi) • [devpost.com/lwahedi](https://devpost.com/lwahedi)

## Education

### Georgetown University

2013-May 2017

- **PhD: Political Science.** International Relations
  - GPA 4/4
  - NSF Fellow
  - Hopper Fellow

### Massachusetts Institute of Technology (MIT)

2007-2011

- **MS: Political Science.** Focus on Security Studies.
  - GPA 5/5 (4/4).
- **BS: Political Science. BS Brain and Cognitive Sciences,** (Molecular neurobiology).
  - GPA: 4.6/5 (3.6/4). Major: 4.9/5 (3.9/4)

### Additional Programs

- ICPSR (Summer, 2015): Advanced Bayesian Methods, Advanced Game Theory, Complex Systems, Time Series, Advanced Multivariate Methods. Received EITM certification. GPA: 4.0.
- Army civilian training: Army Working Capital Fund (Calibre, January 2012); Fiscal Law; Lean Six Sigma Green Belt
- MIT Professional Summer Training; Decision-making Design, and Strategy Under Uncertainty (July 2012); Data Models in Engineering, Science, and Business (August 2012)

## Awards and Distinctions

- NSF GRFP Fellow, 2013-2017
- Data Science for Social Good Fellow 2016
  - Summer Fellowship at U. Chicago
- Hopper Fellow, 2016-2017
  - Georgetown teaching fellowship
- EITM Certification Scholarship Recipient 2015
  - Quantitative methods training at ICPSR
- Global Governance Futures Fellow, 2016-17
  - One of five delegates to represent the US at a summit on global governance.
- FedTech Fellow, Fall 2017
  - Selective entrepreneurial incubator
- 2<sup>nd</sup> place award for a data visualization app. From MedImmune, at HopHacks Sp2016.
- Prestage Cook Travel Award 2016
- Georgetown Travel Grant (Competitive) 2015, 2016
- MIT Ilona Karmel Writing Competition,
  - 1<sup>st</sup> place award, 2011
- Sarah Cooper Memorial Scholarship
  - Full tuition and stipend, 2008-11
- Community Catalyst Leadership Program
  - Selective yearlong program. Participated in several workshops and received personal leadership coaching, 2009-10
- Freshman Leadership Program
  - Weeklong selective pre-orientation program focusing on leadership
- ISEF finalist, 2007.
  - State overall Finalist, 1<sup>st</sup> in biochemistry.
  - 1<sup>st</sup> from Endocrinology Soci

## Research

### Devils in the Details: Learning and Diffusion in Networks of Violent Groups

- Adopting new tactics helps violent groups to adapt and survive, but both adopting and sharing new tactics is risky. Groups mitigate this risk by sharing with and learning from partners. This is shaped by the competitiveness of the security and information environment, which is shaped by the structure of the network. Dissertation paper, revising for submission.

### Anti-Social Networks: The Effects of Violent Group Cooperative Network Structure on Capacity for Violence and Survival

- The structure of partnerships between violent groups, as well as a group's relative position within that structure, both shape the security environment. Militant network centralization predicts increased

system- and individual-level lethality. Well-connected groups in centralized local networks live longer and are more lethal than well-connected groups in decentralized local networks. Dissertation paper, revising for submission.

**Analysis of petitions to the Government of Mexico, with Andrea Navarrete, Garren Gaut, Paul Van der Boor, Adolfo de Unanue**

- Designed automation system for processing citizen petition for the Government of Mexico, using natural language processing and machine learning techniques. Revising for submission.

**Bloody Benefactors: Transnational Terrorist Sponsorship in Civil Wars**

- When do global violent groups partner with local rebels? Transregional groups want strong partners that are a secure investment, but strong local groups prefer autonomy and only accept sponsorship when they have no alternative. Dissertation paper, revising for submission.

**Tracking Terrorist Influence Online, with Lisa Singh lab**

- Using official statements by terrorist groups such as al Qaeda and ISIS, I track the influence that each group has within online communities by tracing rhetorical frames over time and across online spaces. I am exploring whose language is used, and who influences which discourse.

**Forced Migration Early Warning System, with Lisa Singh Lab**

- Using a combination of signals identified by political scientists as well as social media and news data, we are developing an early warning system to when people will flee, and where they will go. Signals differ for different categories of forced migration. Using twitter and news dataset from Syrian Civil War.

**Information Diffusion in Parenting Networks, with Lisa Singh Lab**

- Exploratory analysis of online networks of parents to understand how information and misinformation spreads, and to compare signals from Twitter to responses to surveys to better understand what we can and cannot learn from Twitter about parenting behavior. I am working on preliminary network analysis.

**From Partners in Crime to Criminal Networks: Predicting Terrorist Alliance Network Formation**

- Partnerships between militant groups are beneficial but risky, resulting in tensions that groups must overcome before forming partnerships. I model how these tensions at the individual level aggregate into network formation using a computational model.

**Neural Correlates of Ultimatum Game Decision-Making, with Shady El Damaty & John VanMeter**

- Using fMRI and an adapted ultimatum game construct, we examined the effect of affective priming on decision-making. Preliminary findings provide no support for the uncertainty hypothesis (that uncertainty begets greater concessions,) and suggest that the neural correlates of decision-making after exposure to a negative prime are the same as the neural correlates of decision-making in response to an unfair offer, suggesting that the fairness-sensitivity reported in previous studies may actually be a negative emotional response. Implications for debate on efficacy of terrorism and interstate threats.

## Teaching

**Terrorism and Rebellion**

- Advanced undergraduate course on violent non-state actors, with a focus on interdependence between actors, and causal inference between groups.

**Data Science Seminars**

- Three workshops for public policy masters students on data science covering data manipulation and basic analysis in Python, text mining, and network analysis. Workshops are primarily hands on to give students skills needed to complete their theses, but text mining and network sections include basic theory.

## Past Research and Projects

**The Effects of Fuel Price Volatility on Military Readiness**

- Used process tracing to explore the ways in which in-year changes in fuel price could affect readiness, conducted interviews with relevant parties in OSD and the services. Concluded that fuel volatility has not had an effect on readiness, but that it represents an exogenous shock that could multiply extant budgetary difficulties, and exacerbate problems. Published in IDA report.

### **Ground Force Supply and Demand Model**

- Developed a probabilistic model to predict future US ground force demand using historical data, in Matlab. Part of effort to hedge US armed forces against an uncertain future, and explore the effects of alternative force mixes and readiness strategies. Interfaces with a cost model to provide twenty year estimates under different expectations about the future, or force generation policies. Published in several IDA reports.

### **WellSpring**

- Produced for the HopHacks hackathon, January 2016. 2<sup>nd</sup> place sponsor award from MedImmune
- Created an android app that presents localized water quality data. Database is populated by EPA water violation data, and data crowdsourced through the app. I parsed the data, contributed to database population, and android development. Java, NoSQL, AWS.

### **Analysis of Alternatives for Missile Defense Systems**

- Analysis of possible sensors to meet needs for missile defense system.
- Contributed to point paper for Secretary of Defense. Wrote slides for Deputy Secretary of Defense

### **Cost of the Reserve**

- Developed novel costing methodology for allocating Army active and reserve force costs.

### **CharityAPI**

- Produced for the HoyaHacks hackathon, January 2016.
- Created an API for IRS data from nonprofit 990 filings. This API will facilitate streamlined verification of organization non-profit status. Ruby.

### **Master's Thesis Work on the Effect of Irregular Leadership Change on State Failure Recovery**

- Found that state failure is longer after irregular/ non-constitutional leadership changes. Did field work in Afghanistan, used Afghan civil war as illustrative case study.

### **Context Dependent Factors in Motivation**

- Investigated effects of social, monetary, and tangible reward on motivation. Found that social reward can be more powerful than tangible rewards, suggesting a role for altruism and social influence.
- A follow-up analysis used survey data to investigate the context dependence of motivation. Motivation was found to be highly context dependent, explaining the large variation within the literature.

### **Process Fluency, Learned Behavior, and Social Identity Theory**

- Explored cognitive processes behind social identity theory and racial discrimination. Proposed connection between cognitive tendency to mentally segregate objects and the fact that linguistic labels increase the salience of mentally segregated groups. Further proposed connection between process fluency and social identity theory, because members of an in-group have easier to process attributes and thus are more trusted. Proposed detailed series of studies using infants at various stages of development to test the innateness of social identity discrimination.

## **E**xperience

### **Research Fellow, Massive Data Institute, McCourt School for Public Policy, Georgetown University** July 2017-present

- Social scientist/data scientist on an interdisciplinary research team. Research areas range from Topic modeling of ISIS and al Qaeda rhetoric, to forced migration, to the neuroeconomics of altruism.
- Work with Twitter and other text data, as well as network data.

### **Data Science for Social Good Fellow, Center for Data Science and Public Policy at Harris School, University of Chicago.** Summer 2016

- Hands on data science training program. Social scientist on multidisciplinary team.
- Worked with Mexican Government to understand internal processes in order to design automation to help them better serve citizens.
- Created pipeline for processing incoming requests made to the government, helping to direct them to relevant departments. Used text data and a sweep of machine learning models.

### **Research Associate, Adjunct, Institute for Defense Analyses** March 2013-present

- Member of the SARA model development team, a million dollar effort to develop a model to look at the effects of different force sizing and generation policies on stochastic futures given user

expectations. I developed the unit demand model for the Army, an integrated unit supply and demand model for the Marines, and contributed to the conceptual design of the Air Force costing component.

- Contributed to a study on the effects of fuel price volatility on readiness. I developed a network across the fuel and readiness offices in OSD and the Services, conducted the qualitative analysis, and wrote the study report.

**Operations Research Analyst, Office of the Secretary of Defense, CAPE** August 2012-January 2013

- Office of Cost Assessment and Program Evaluation, Program Evaluation Directorate, Land Forces Division and Strategic, Defensive, & Space Programs Division; and Analysis and Integration Directorate, Force Structure Requirements & Assessment Division. (Involved in all three divisions)
- Contributed to point paper to inform Secretary of Defense on strategic tradeoffs in missile defense.
- Managed issues in the Science and Technology, Missile Defense, and Land Forces Issue Teams for issues presented to the Secretary of Defense as part of the Program Review process.
- Contributed to a probabilistic demand model to project alternative ground force futures and mitigate risk in scenario-based force optimization. Investigating the effect of variation on grand strategy on force engagement and optimization.
- Contributed to parametric model to predict counterinsurgency requirements.
- Trend analysis to predict alternative future threats and demands on the military.

**Operations Research, Department of the Army, DASA-CE** October 2011-March 2013

- Office of the Deputy Assistant Secretary of the Army for Cost and Economics, within the Office of the Assistant Secretary of the Army, Financial Management and Comptroller. (ASA-FMC).
- Developed a model to compare the costs of the Army components by reallocating costs usually borne by the Active Component for resources used by the Reserve. Research presented at MORSS 2012.
- Served on the Reserve Forces Policy Board Costing Methodology Task Force as the FM&C representative. Pioneered the use of flexible but consistent methodological paradigm using weighting schemes to fairly compare the reserve components among the services.

**Field Work in Afghanistan** Summer 2010

- Conducted interviews of politicians and aid providers for my thesis on irregular executive change.
- Built expanding network of Afghan officials; gained understanding of how the government functions.

**Taught Leadership Seminar for Afghan English Teachers** Summer 2010

- Designed and taught a three-day leadership seminar for the English Language Teacher Association of Afghanistan with an approach I developed, focusing on interpersonal interaction and developing a shared vision.

**Research Internship in Lin Lab at MIT** Spring 2009-Summer 2009

- Research on the role of exogenous calnexin and on homeostatic regulation of GABAergic synapses, with particular focus on the role of transcription factor NPAS4. Developed assay to measure synaptic exogenous calnexin using confocal microscopy and immunocytochemistry.

**Research Internship at MIT, Poli. Sci. Dept. Professor Fotini Christia** Winter 2009

- Researched the rise and fall of the Taliban in Afghanistan, and how they interacted with other warring groups.

**Independent Research at Oregon Health and Science University** Fall 2006- Spring 2007

- Investigated mechanisms of IGF-I Action on the Insulin Receptor. Insulin acts mitogenically through MAPK the pathway, and promotes survival through the PI3K pathway of the insulin receptor. Developed novel assay. Won 1<sup>st</sup> place from the Endocrine Society at International Science Fair (ISEF).

## Skills

- Languages: Python, R, MATLAB, RJAGS, PostgreSQL
- Data Mining Techniques: Machine learning with sklearn, Web scraping, text mining and topic analysis
- Multivariate calculus, probability theory
- Network Analysis
- Various statistical models, including various generalized linear regression models, hazard analysis, Bayesian statistics, multi-level modeling. Matching algorithms such as genetic matching. Parameter estimation

**Languages:** Some Spanish