

Laila A. Wahedi

SWE/ML Trust and Safety Tech Lead | Multidisciplinary Research Scientist

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Education

Georgetown University

PhD: Political Science. International Relations. NSF Fellow, Hopper Fellow

Massachusetts Institute of Technology (MIT)

Masters of Science (MS) Political Science, Focus on Security Studies

Bachelor of Science (BS) Political Science

Bachelor of Science (BS) Brain and Cognitive Sciences, (Molecular neurobiology)

Skills (Technical)

- Programming: Python, source control, Dataswarm (Meta's version of Apache Airflow), Docker
- Data Mining and Processing: SQL and spark, building and maintaining data pipelines, processing unstructured text data, web-scraping
- Network Analysis: Network analysis at scale, graph mining, social network theory, system/ecosystem level thinking, clustering, network structure, measures of influence, centrality, and centralization
- Statistical/ML Models: Embeddings, natural language processing, machine learning, generalized linear regression, hazard analysis, Bayesian statistics, multi-level modeling
- Domain Expertise: illicit networks/hate and terror orgs, election risks, information ops and misinfo, fraud and deception, public benefit/societal impact work, defense, security studies/international relations and conflict processes, strategic force planning, feed ranking algorithms, forced migration

Experience

Tech Lead Software Engineer/ Research Scientist, Core Data Science, Meta

April 2019-Present

- Cross Functional Strategic Leadership: Got buy-in across ~12 teams to lead trust & safety taskforce of ~30-50 across engineering, research, data science, investigations, operations, product, and policy; to identify emerging, unhandled risks to users.
 - Led intel generation effort to build holistic threat assessment for 2022 US Midterm and Brazil Presidential elections, then built detection, provided research for new policy, and designed process to handle top priority risks ahead of and during the elections.
 - Built new methods and deployed them as production tools to support network enforcements for sophisticated threats like coordinated harassment, information operations, and hate/terror orgs.
 - Produced research supporting new policy development on sophisticated threats such as coordinated violating networks and hate organizations.
 - Built new methods for identifying emerging threats quickly during crisis events and elections
- Tech led engineering team of 5-11. Developed and maintained ML tech stacks for launching graph mining models to mitigate most sophisticated or complex ecosystem-level risks identified and prioritized by cross-team taskforce.
- Translate technical methods/concepts into accessible tooling for non-technical users. E.g. Election monitoring tools, expanding investigation recall.
- Full life cycle: Research on effect of innovative mitigations, and translated findings back into personally building better product and policies. E.g. research on violating social movements to policy to building ML scaled detection.

Research Fellow, Massive Data Institute, McCourt School of Public Policy, Georgetown.

July 2017-April 2019

- Enabled multidisciplinary publications as a social scientist/data scientist on a computer science team.
- Domains included: topic modeling of ISIS and al Qaeda rhetoric, predicting forced migration patterns with social media data, mapping online journalist networks, mapping influence operations, developing data blending techniques.
- Managed team of MS student researchers. Taught data science seminars.
- Skills: Large unstructured text data, social media data. Network analysis, hierarchical Bayesian modeling, sql databases, web-scraping scripts, blending noisy data.

Data Science for Social Good Fellow, Harris School, University of Chicago.

Summer 2016

- Built AI system to process and prioritize incoming petitions to the Mexican government, allowing them to process 24.4% more petitions with given resourcing constraints, alleviating months-long backlog to provide support services.
- Skills: Processing unstructured text data into structured data, data pipelining, sql, machine learning models

National Science Foundation Fellow, Georgetown University

September 2013- June 2017

- Research on rivalry and alliance networks of terrorist and rebel organizations. Taught seminar on Terror & Rebellion

Research Associate, Institute for Defense Analyses

March 2013-March 2016

- Force planning strategy: Developed million-dollar model to estimate the effect of different military force generation strategies on readiness for different grand strategies, and the cost for each. Used by office of the Sec Def and Service Headquarters in budget justifications.
- Shaped Navy acquisitions strategy: identified mechanisms by which price changes could impact unit readiness, finding that units adapted to maintain readiness.

Operations Research Analyst, Office of the Secretary of Defense, CAPE

August 2012-January 2013

- Produced analysis and reports for Secretary of Defense on strategic tradeoffs in missile defense resulting in shift in missile defense posture in Europe.
- Evaluated service budget against Defense priorities, grand strategy options, and scientific viability for the Science and Technology, Missile Defense, and Land Forces Issue Teams as part of the Program Review process.

Operations Research Analyst, Department of the Army, HQ, 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).
- Modeling 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

2010

- Conducted interviews of politicians and aid providers for my thesis on irregular executive change.
- Built expanding network of Afghan officials

Research in Lin Lab at MIT

2009-2010

- 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 at MIT, Poli. Sci. Dept. Professor Fotini Christia

2009

- Mapped 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

2006- 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 1st place from the Endocrine Society at International Science Fair (ISEF).

Awards and Distinctions

- Global Challenges Foundation New Shape Forum semi-finalist, 2019
- NSF GRFP Fellow, 2013-2017
- Data Science for Social Good Fellow 2016
- Hopper Fellow, 2016-2017 (teaching award)
- EITM Certification Scholarship Recipient 2015: Quantitative methods training
- 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
- 2nd place award for a data visualization app. From MedImmune, at HopHacks Sp2016.

Research/ Projects: See full list at <https://wahedi.georgetown.domains/publications/>

Effects of Network Disruptions Targeting Hate Organizations on Social Media (Forthcoming PNAS) with Daniel Thomas

Measured the effect of network-level disruptions of 6 hate organizations on their former audiences on Facebook, finding that more peripheral members of the audience reduced their consumption and production of hate content,

while there was a temporary backlash among users who were closest to the de-platformed users, but that this backlash subsided within two months. Used a staggered diff-in-diff design to estimate effects.

Blending Noisy Social Media Signals with Traditional Movement Variables to Predict Forced Migration (KDD) with Lisa Singh lab

Integrating publicly available organic data from social media and newspapers with more traditional indicators of forced migration can improve performance of models to determine when and where people will move, better enabling the pre-allocation of aid resources. Used Bayesian hierarchical models to blend data at different spatial and temporal granularity to model displacement in Iraq.

A Novel Approach to Participant-Level Influence Calculation in Viral Cascades with Nick Hagar and Eric Dunford

A novel, scalable method for generating individual-level influence measures across a set of social media cascades, and demonstrate its applicability in real scaled data.

Analysis of petitions to the Government of Mexico (ACM COMPASS), 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.

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. Published in IDA report.

Ground Force Supply and Demand Model

Developed a probabilistic model to predict future US ground force demand using historical data. 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.

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.

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.

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. No support for the uncertainty hypothesis (uncertainty begets greater concessions.) Suggest that the neural correlates of decision-making after exposure to a negative prime are the same as for decision-making in response to an unfair offer, and the fairness-sensitivity reported in previous studies may actually be a negative emotional response.

WellSpring. HopHacks hackathon, January 2016. 2nd place sponsor award from MedImmune

- Android app for finding localized water quality data from EPA database and app crowdsourcing.

CharityAPI. HoyaHacks hackathon

- Created an API for IRS data from nonprofit 990 filings. This API will facilitate streamlined verification of organization non-profit status. Ruby.

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

- Hands on workshop series for public policy Masters students. Data manipulation and basic analysis in Python, text mining, and network analysis.

Leadership Seminar for Afghan English Teachers Association

- Three-day leadership seminar, focusing on interpersonal interaction and developing a shared vision.