STEPHANIE A. ALLEN

LinkedIn ◇ https://sallen7.github.io/

OBJECTIVE

To utilize my technical expertise in mathematical modeling and simulation to inform policy makers about decision making and system-of-systems approaches

EDUCATION

Ph.D. Applied Mathematics, Statistics, and Scientific Computation, University of Maryland, College Park
Scientific Computing Track, August 2017 - December 2022
Dissertation: *Working in Reverse: Advancing Inverse Optimization in the Fields of Equilibrium and Infrastructure Modeling*
Advisors: Dr. Steven A. Gabriel & Dr. John P. Dickerson
Funding: Graduate Fellowship for STEM Diversity (Second Year Onward) & Teaching Assistantship (First Year)
GPA: 4.0/4.0

M.S. Applied Mathematics, Statistics, and Scientific Computation, University of Maryland, College Park
August 2017 - May 2020
GPA: 4.0/4.0

B.A., State University of New York (SUNY) Geneseo
Majors: Mathematics and Economics
Minor: Edgar Fellows Honors Program
August 2013 - May 2017
GPA: 4.0/4.0, *Summa cum laude*

SKILLS

Technical Skills	Optimization, Operations Research, Graph Analytics, Scientific Computation, Statistics
Computing Languages	Python & MATLAB (Intermediate)
Software & Tools	LaTeX (Intermediate), Excel (Beginner)

PAPERS/PUBLICATIONS

Allen, Stephanie, Daria Terekhov, and Steven A. Gabriel. "A hybrid inverse optimization-stochastic programming framework for network protection." *Journal of the Operational Research Society* 75.7 (2024): 1347-1370.

Allen, Stephanie, Steven A. Gabriel, and John P. Dickerson. "Using inverse optimization to learn cost functions in generalized Nash games." *Computers & Operations Research* 142 (2022): 105721.

Allen, Stephanie, Steven A. Gabriel, and Nathan T. Boyd. "Inverse Optimization for Parameterization of Linear Complementarity Problems and for Incentive Design in Markets." (2022). (Under review by a peer-reviewed journal)

Allen, Stephanie, John P. Dickerson, and Steven A. Gabriel. "Centralized vs Individual Models for Decision Making in Interconnected Infrastructure." *ICML 2022 2nd AI for Science Workshop* (2022).

Allen, Stephanie. "A Two-Stage Vehicle Routing Algorithm Applied to Disaster Relief Logistics after the 2015 Nepal Earthquake." *SIAM Undergraduate Research Online (SIURO)* (2018).

Allen, Stephanie, David Madras, Ye Ye, and Greg Zanotti. "Change-point detection methods for body-worn video." *SIAM Undergraduate Research Online (SIURO)* (2016).

SELECTED PRESENTATIONS

"Inverse Optimization for Parameterization of Linear Complementarity Problems and for Incentive Design in Markets," Trans-Atlantic Infraday 2022, November 2022.

"Centralized vs Individual Models for Decision Making in Interconnected Infrastructure," ICML 2022 2nd AI for Science Workshop (Poster), July 2022.

"Using Inverse Optimization to Learn Cost Functions in Generalized Nash Games," NTNU Winter School 2022, March 2022.

"Using Inverse Optimization to Learn Cost Functions in Generalized Nash Games," INFORMS 2021, October 2021.

"Using Inverse Optimization to Learn Cost Functions in Generalized Nash Games," ECOM 2021, April 2021.

"A Hybrid Inverse Optimization-Stochastic Programming Framework for Network Protection," Trans-Atlantic Infraday 2021, November 2021.

"A Hybrid Inverse Optimization-Stochastic Programming Framework for Network Protection," INFORMS 2020, November 2020.

"Working in Reverse: Inverse Optimization Methods for Pyomo in Online Settings," INFORMS 2019, October 2019.

"Working in Reverse: Inverse Optimization in Pyomo," Joint Mathematics Meetings 2019, January 2019.

RESEARCH EXPERIENCE

Johns Hopkins University Applied Physics Laboratory (APL) November 2022 - Present
Senior Professional Staff I

- Provide technical expertise and lead teams in graph analytics, game theory, data fusion, sensor modeling & simulation, and system-of-systems architectures in order to inform government sponsors about decision making and requirements generation.
- **Role as Rotational Assistant Program Manager (APM) (August 2025 - Present):** Manage the programmatics of a group of projects at APL and engage in new sponsor development. Interface with upper level management.
- **Role as Project Manager/Principal Investigator (PI) (January 2025-Present):** Oversee a large project for a government sponsor involving multiple interdisciplinary teams spanning sensor modeling, data fusion, graph analytics, & resource management and involving multiple stakeholders.
    - Manage the response to quick turn analysis questions and longer term analysis efforts. Completed studies have had significant impact and have influenced high-level decision makers.
- **Role as Project Manager/Deputy PI (June 2024-September 2024):** Led the end of a project in graph analytics methodologies for sponsor questions and in report generation for sponsor. Kept the project on time & on budget.
- **Role as Co-PI for Internal IRAD Grant (October 2023-September 2024):** Studied the use of a game theoretic framework for resource management. Managed two Ph.D. level staff in executing the direction of the effort.
- **Role as Assistant Project Manager/Deputy PI (June 2023-February 2025):** Helped to manage the activities of a large project at APL through engaging with sponsors, managing tasking, and leading technical portions of the project.
    - Led technical teams in graph analytics modeling approaches to sponsor asks and in modeling system-of-systems architectures.
    - Coordinated with multiple sites on system-of-systems experimentation set-up
    - Briefed multiple high-level decision makers on technical deliverables and status
- **Role as Acting Assistant Section Supervisor (May 2023-December 2025):** Helped manage a small group of technical individuals by organizing tasking when necessary, serving as a resource, interfacing with upper management, and preparing advancement packages for section members.

University of Maryland, College Park September 2018 - December 2022
Ph.D. Student Supported by Graduate Fellowship for STEM Diversity (GFSD)

- Won the Graduate Fellowship for STEM Diversity external fellowship award for my second year of graduate school onward - $20,000 per year plus tuition, healthcare, and fees covered
- Produced three first author papers while supported by this fellowship:
    1. "A Hybrid Inverse Optimization-Stochastic Programming Framework for Network Protection"
    2. "Using Inverse Optimization to Learn Cost Functions in Generalized Nash Games"
    3. "Inverse Optimization for Parameterization of Linear Complementarity Problems and for Incentive Design in Markets"
- Produced a first author workshop paper for a workshop at one of the top machine learning conferences (ICML) entitled: "Centralized vs Individual Models for Decision Making in Interconnected Infrastructure." Presented as a poster at the workshop
- Produced as a year-long second year project code that implemented state-of-the-art inverse optimization methods in Python and the code is available here: https://github.com/sallen7/inverse_optimization

University of Maryland, College Park June 2022 - July 2022
Graduate Student Researcher on National Science Foundation Grant #2113891

- Paid over Summer 2022 to develop approaches for inverse optimization for linear complementarity problems and the application of these techniques to a water supply market as part of NSF Grant #2113891
- Started this research before the summer and finished it after the summer to produce the paper "Inverse Optimization for Parameterization of Linear Complementarity Problems and for Incentive Design in Markets."
- Presented findings at a stakeholder meeting

Johns Hopkins University Applied Physics Laboratory May 2018 - August 2021
Graduate Student Intern

- Worked in Summer 2018, 2019, 2020, & 2021 on problems involving data fusion and modeling
- Responsible for developing new algorithms and models for Lab problems

· Wrote technical reports for the Lab about research
· Supervised a college student on a statistics project during Summer 2018

Institute for Pure and Applied Mathematics (IPAM) at UCLA June 2016 - August 2016
Research in Industrial Projects for Students (RIPS) LAPD Team Project Manager

· Collaborated on a two-stage framework to detect salient changes in LAPD body-worn video
· Developed and implemented via MATLAB statistical methods/algorithms to detect significant shifts in time series data
· Supervised team progress, represented the team in RIPS program meetings, and interfaced with LAPD sponsors as the team's Project Manager
· Published paper through SIAM Undergraduate Research Online (SIURO) entitled, "Change-point Detection Methods for Body-Worn Video"
· Presented at the 2017 Joint Mathematics Meetings and the 2017 Nebraska Conference for Undergraduate Women in Mathematics (NCUWM)

Social and Decision Analytics Laboratory at Virginia Tech May 2015 - August 2015
REU Summer Student Fellow

· Evaluated/contacted data sources and found literature for the Lab's Census Bureau Project
· Applied statistical methods via R and Excel to Census datasets with the research goal of identifying demographic groups overrepresented among the impoverished in Arlington County (dplyr and survey packages)
· Prepared working paper based on results from this independent research entitled, "Overrepresentation and Underrepresentation: Those in Need in Arlington County"

SUNY Geneseo Mathematics Honors Capstone and Edgar Fellows Honors Thesis Sept. 2016 - May 2017
A Two-Stage Vehicle Routing Algorithm Applied to Disaster Relief Logistics after the 2015 Nepal Earthquake

· Modeled the Himalayan Disaster Relief Volunteer Group's delivery of supplies after the 2015 Nepal Earthquake as a vehicle routing problem (VRP) using Fisher and Jaikumar's two-stage method, which allocates locations to vehicles via an integer program and then uses heuristics to route the vehicles
· Paper selected as a finalist for the 2017 INFORMS Undergraduate O.R. Prize Competition
· Presented at the Pi Mu Epsilon 2017 Conference and won the Mathematical Association of America Environmental Mathematics Special Interest Group Student Speaker Award

LEADERSHIP & SERVICE

Women in Mathematics (AWM Chapter), UMD, College Park August 2018 - May 2021
President, Vice-President, & Secretary

· Role as President (2020-2021): Manage all of the events undertaken by the organization including speaker, professional development, and social events
· Role as Vice President (2019-2020): Assisted the President with the logistics and planning for some of the speaker, professional development, and social events undertaken by the organization
· Role as Secretary (2018-2019): Took notes during meetings and contributed ideas regarding events

AMSC Program, UMD, College Park September 2021 - May 2022
AMSC Student Council (ASC) Treasurer

· Assisted in the planning and execution of AMSC Student Council events
· Kept a spreadsheet regarding AMSC Student Council finances

AMSC Program, UMD, College Park August 2019 - May 2022
New Student Mentor

· Served as a resource for 1-3 first year students in the AMSC Ph.D. program
· Attended events associated with the New Student Mentor program and provided advice to the students

University Senate, UMD, College Park September 2019 - April 2020
Graduate Student Senator

· Reviewed and voted on new policies up for consideration in front of the University Senate

Food Security Advocates (FSA), SUNY Geneseo September 2014 - May 2017
Co-Founder/President

· Oversaw all projects of FSA, a student organization focused on fighting hunger and food insecurity

- Developed partnerships and organized events with pertinent campus, non-profit, and government organizations
- Government Projects included coordinating and sustaining a Livingston County child nutrition program through administrative communications and end-of-semester food drives (six in total) and included running pre-screening clinics and outreach events for SNAP benefits
- Campus and non-profit events included assisting with the planning of the Geneseo Martin Luther King Day of Service, organizing and participating in speaker events regarding food insecurity, running a spice drive for a program that teaches cooking skills to low income individuals, running a cooking class with a youth program, and volunteer trips to a regional foodbank
- Served on the Martin Luther King Day of Service Committee and the Advisory Committee on Volunteer & Service Programs (which chose recipients of service awards and discussed service on campus)

PROFESSIONAL DEVELOPMENT

AAAS Catalyzing Advocacy in Science and Engineering (CASE) Workshop March 2023
American Mathematical Society Sponsored Participant

- Participated in this workshop about science policy and advocacy
- Visited and talked with elected officials on Capitol Hill
- Chosen as one of two graduate students sponsored by the American Mathematical Society to attend the 2023 workshop

TEACHING

University of Maryland, College Park August 2017 - May 2018
Teaching Assistant *Courses: Calculus I & II for Engineers*

- Ran recitation sessions for students
- Graded quizzes and exams for students
- Held office hours for students to help with problems they were having with the classes

HONORS & AWARDS

JHU APL Analytical Achievement Award	2024
AMSC Leadership Award	Spring 2021
Graduate Fellowship for STEM Diversity (GFSD)	Fall 2018 - Fall 2022
University of Maryland, College Park Flagship Fellowship	Fall 2017 - Spring 2022
Phi Beta Kappa	May 2016
SUNY Chancellor's Award for Student Excellence	Spring 2017
SUNY Geneseo Presidential Scholar	Fall 2016

PAPER REVIEWER

Economics and Computation 2021 (EC'21)	2021
Energy Systems	2020

CONFERENCE SESSION ORGANIZER

AMS Data Fusion Session	JMM 2025
Learning and Equilibria Session	INFORMS 2021