

# STEPHANIE A. ALLEN

College Park, MD

[LinkedIn](#) ♦ <https://sallen7.github.io/>

## EDUCATION

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**Ph.D. Applied Mathematics, Statistics, and Scientific Computation**, University of Maryland, College Park  
Scientific Computing Track, Expected Summer/Fall 2022  
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

**Bachelor of Arts**, 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

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<b>Technical Skills</b>	Optimization, Operations Research, Scientific Computation, Statistics
<b>Computing Languages</b>	Python & MATLAB (Intermediate)
<b>Software &amp; Tools</b>	LaTeX (Intermediate), Excel (Beginner)

## PUBLICATIONS

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Allen, Stephanie, John P. Dickerson, and Steven A. Gabriel. "Using Inverse Optimization to Learn Cost Functions in Generalized Nash Games." *arXiv preprint arXiv:2102.12415* (2021).

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 Zanoliti. "Change-point detection methods for body-worn video." *SIAM Undergraduate Research Online (SIURO)* (2016).

## SELECTED PRESENTATIONS

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"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

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<b>Johns Hopkins University Applied Physics Laboratory</b> <i>Graduate Student Intern</i>	May 2018 - Present
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- Worked on problems involving data fusion and modeling
- Responsible for developing new algorithms and models for Lab problems
- Written technical reports for the Lab about research
- Supervised a college student on a statistics project during Summer 2018

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

- 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"

## RESEARCH PROJECTS

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### Dissertation Project 1

January 2020 - February 2021

*Using Inverse Optimization to Learn Cost Functions in Generalized Nash Games*

- Extended a method in the inverse optimization literature to the case of generalized Nash equilibrium games
- Wrote extensive code for transportation problem numerical experiments to demonstrate the framework. Code can be found here: [https://github.com/sallen7/IO\\_GNEP](https://github.com/sallen7/IO_GNEP)

### Dissertation Project 2

November 2019 - May 2021

*A Hybrid Inverse Optimization-Stochastic Programming Framework for Network Protection*

- Proposed that inverse optimization can be used to parameterize cost functions in multi-stage stochastic programs for disaster management and can be used in disaster support systems
- Undertook computational experiments with two different cost functions and two different road networks to illustrate this hybrid inverse optimization-stochastic programming framework
- Paper will be available soon via arXiv.

### Advanced Scientific Computing I-II

September 2018 - May 2019

*Working in Reverse: Inverse Optimization Methods for Pyomo in Static and Online Settings*

- Undertook as a two-semester long research project at UMD, College Park that examined inverse optimization methods
- Implemented state-of-the-art inverse optimization methods in Python
- To view the code for this coursework sequence, see [https://github.com/sallen7/inverse\\_optimization](https://github.com/sallen7/inverse_optimization)

### 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*

- Examined vehicle routing over the course of a two-semester senior thesis project at SUNY Geneseo
- 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
- Created scripts for data processing, graphics production, and LaTeX table production
- Results reiterated the open nature of the VRP and the computational necessity of heuristics
- 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

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### Women in Mathematics (AWM Chapter at 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

August 2019 - May 2021

*New Student Mentor*

- Serve as a resource for 2-3 first year students in the AMSC Ph.D. program
- Attend events associated with the New Student Mentor program and provide advice to the students

**University Senate, UMD, College Park**  
*Graduate Student Senator*

September 2019 - April 2020

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

**Food Security Advocates (FSA), SUNY Geneseo**  
*Co-Founder/President*

September 2014 - May 2017

- 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 chooses recipients of service awards and discusses service on campus)

## **HONORS & AWARDS**

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**AMSC Leadership Award**

Spring 2021

**Graduate Fellowship for STEM Diversity (GFSD)**

Fall 2018 - Present

**University of Maryland, College Park Flagship Fellowship**

Fall 2017 - Present

**Phi Beta Kappa**

May 2016

**SUNY Chancellor's Award for Student Excellence**

Spring 2017

**SUNY Geneseo Presidential Scholar**

Fall 2016

## **PAPER REVIEWER**

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**Economics and Computation 2021 (EC'21)**      2021

**Energy Systems**      2020