

# Matthew Andres Moreno

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## Education

*Bachelors of Science* in Mathematics, Computer Science (GPA: 3.96/4.0)  
*Minor* in Chemistry, Coolidge Otis Chapman Honors Scholar  
University of Puget Sound, Tacoma, WA

Expected: May 2017

## Relevant Coursework

*Mathematics*: Linear Algebra, Ordinary Differential Equations, Partial Differential Equations, Topology, Probability, Mathematical Statistics, Complex Analysis, Abstract Algebra I  
*Computer Science*: Assembly Language & Computer Architecture, Programming Paradigms, Introduction to Artificial Intelligence, Software Engineering, Algorithms and Data Structures, Operating Systems  
*Biological Sciences*: Organic Chemistry I & II, Cellular Biology, Genetics, Evolution, Neuroscience

## Skills

*Programming Languages*: Python, Java, C, OpenCL, Prolog, Haskell  
*Miscellaneous*:  $\text{\LaTeX}$ , Wolfram Mathematica, Matlab, SageMath, Git, Bash

## Academic Awards

- Dean's List (Spring 2014-Present)
- Member of Otis C. Chapman Honors Program (2013-Present)
- Member Phi Beta Kappa (2016-Present)
- Member Pi Mu Epsilon (2016-Present)
- Recipient of Great Lakes National Scholarship Program Award (2016-2017)
- Recipient of James R. Slater Phi Beta Kappa Award (2016-2017)
- Recipient of Puget Sound Association of Phi Beta Kappa Scholarship (2016-2017)
- Recipient of Honors Alumni Scholarship (2015-2016, 2016-2017)
- Recipient of Thomas and Hilda Jack (2014-2015), Sprenger (2015-2016, 2016-2017), and McKnight Memorial (2016-2017) Scholarships in chemistry
- Recipient of McGill Family (2015-2016), McKnight (2015-2016), and Thomas and Hilda Jack (2016-2017) Scholarships in mathematics
- Recipient of Beta Theta Pi Men of Principle Scholarship (2014-2015)
- Recipient of University of Puget Sound Trustee Scholarship (2013-2017)
- National AP Scholar (2013)

## Research Experience

*Otis C. Chapman Honors Thesis* — University of Puget Sound

Fall 2016, Spring 2017

- *Student Researcher*

- Conducted a review of Evolutionary Computing literature and synthesized a theoretical analysis of evolvability.
- Performing computational experiments with Genetic Regulatory Network models to probe the relationship between phenotypic plasticity and evolvability.
- Project conducted with advisor Dr. America Chambers and reader Dr. Adam Smith.
- Gave oral presentation at NW Honors Symposium.
- Thesis project will culminate in a written document and oral presentation at the University of Puget Sound in April 2017.

*Mathematical Biosciences Institute (MBI) Research Experience for Undergraduates* — Newark, NJ

Summer 2016

- *Student Researcher*

- Designed and numerically evaluated an individual-based set of differential equations to model the foraging behavior of ants over uneven terrain, analyzed predictions of the model over various experimental conditions.
- Worked with advisors Jason Graham and Simon Garnier in the Swarm Lab at the New Jersey Institute of Technology.
- Gave oral and poster presentations at a capstone conference in Columbus, Ohio.
- Attended seminars and workshops on mathematical biology coordinated by MBI at The Ohio State University.

*Automated Extraction of Mouse Ultrasonic Vocalizations from Noisy Recordings* — Tacoma, WA

Summer 2015

- *Student Researcher*

- Designed, applied for grant funding, and carried out project with advisor Adam Smith.
- Funded for eleven weeks as a NASA Research Scholar.
- Developed and tested filtering algorithms inspired by the Sobel Edge detection method that, after being trained on human-annotated spectrograms of mouse vocalizations, distinguish between true mouse vocalization signals and background noise.
- The project culminated in a poster session on campus attended by faculty, summer research students, and other students.

- *Contest Participant*

- Collaborated in a small team of three students for four days to develop a mathematical model in response to a prompt.
- The project results in a journal-style paper describing our model, results, and outlining recommendations to policy makers.
- In 2015, developed an epidemiological model to investigate the spread of Ebola virus disease and make recommendations on vaccine distribution.
- In 2016, developed a model of satellite fragmentation events and the subsequent disbursement of debris in orbit to investigate the feasibility of quick-response efforts to neutralize debris generated by satellite explosions and collisions; our team received received an “Honorable Mention” designation in the competition.

US Department of Agriculture Horticultural Crops Research Unit — Corvallis, OR

June 2013 – Present

- *Biological Science Aide*

- Collected data for patent applications, perform plant propagation, assist with field maintenance.

John Fowler Laboratory at Oregon State University — Corvallis, OR

Summer 2011, 2012

- *Laboratory Assistant*

- Performed experimental inquiry into the role of the exocyst complex in *Arabidopsis thaliana* culminating in a symposium presentation.

**Publications and Presentations**

Matthew Moreno. *Modeling the Collective Behavior of Ants on Uneven Terrain*. Joint Mathematics Meetings, Atlanta, GA. January 2017.

Matthew Moreno. *Modeling Ant Foraging on Uneven Terrain*. Elements Science Magazine, University of Puget Sound. December 2016.

Matthew Moreno. *Evolvability in Evolving Artificial Neural Networks*. NW Honors Research Symposium, Seattle Pacific University. November 2016.

Matthew Moreno. *Modeling the Collective Behavior of Ants on Uneven Terrain*. Fall Poster Symposium, University of Puget Sound. September 2016.

Matthew Moreno. *Modeling the Collective Behavior of Ants on Uneven Terrain*. Undergraduate Capstone Conference, Mathematical Biosciences Institute at The Ohio State University. August 2016.

Matthew Moreno and Becky Hanscam. *Relieving the Space Jam: Assessment of a Quick-Response Satellite Mission to Neutralize Debris from Orbital Fragmentation Events*. Math/CS Day, University of Puget Sound. April 2016.

Matthew Moreno. *Automated Extraction of Mouse Vocalizations from Noisy Recordings*. Fall Poster Symposium, University of Puget Sound. September 2015.

Matthew Moreno. *Mathematical Contest in Modeling: Eradicating Ebola*. Math/CS Day, University of Puget Sound. May 2015.

**Employment**

University of Puget Sound Center for Writing, Learning, and Teaching

September 2015 – Present

- *Tutor and Academic Consultant*

University of Puget Sound Mathematics and Computer Science Department

September 2014 – Present

- *Tutor and Grader*

University of Puget Sound Chemistry Department

September 2013 – May 2016

- *Storeroom Assistant*

University of Puget Sound Chemistry Department

September 2013 – May 2016

- *Storeroom Assistant*

Network Enterprises, LLC

September 2010 - August 2013

- *Web Design Assistant***Service Activities**

- National Conference on Peer Tutoring in Writing, session chair and volunteer (2016)
- Mount Tahoma High School, tutor (2016)
- University of Puget Sound Access Services, access coach for Tuesday Night Tutoring (2016)
- Jason Lee Middle School Access to College Days, student panelist (2016)
- Oakland High School, Homework Club leader and classroom assistant (2016)
- Youth Orchestral Recital Series, ensemble member (2016)
- University of Puget Sound Office of Donor Relations, student speaker (2016)
- Puget Sound Wind Youth Wind Ensemble, coach (2015-2016)
- University of Puget Sound Student Accessibility and Accommodation, note taker (2015, 2016)
- University of Puget Sound Commencement Band, performer (2014, 2015, 2016)
- University of Puget Sound Wind Ensemble and Symphony tours, performer (2014, 2015, 2016, 2017)
- Puget Sound Conductors Institute, ensemble member (2014, 2015, 2017)

- ACM International Collegiate Programming Contest, volunteer (2014, 2015)
- Le Comte Ory, pit orchestra player (2015)
- Wilson High School, AP Tutor (2014)
- Jacobsen Children's Concert, performer (2014)
- Collage Concert, performer (2014)

#### **Extracurricular Activities**

- Oboe performance in University Wind Ensemble (co-principal) and Symphony, private study
- Model United Nations Club, conference delegate and treasurer (2013 - 2016)
- University of Puget Sound Economics Department Blog, contributor (2013 - 2016)