NATHANIEL HAWKINS

I am currently pursuing my PhD in computational biology at Michigan State University. My research focuses on applying methods from the field of natural language processing to analyzing biomedical text. Included in this work are aspects of machine learning, data science, algorithm design/development, and high-performance computing.

I am broadly interested in the field of computational science and using computers to advance our understanding of complex problems. My general areas of interest include machine learning, scientific software development, algorithms and data structures, parallel programming and multiprocessing, high-performance computing, and the application of these concepts to solving meaningful, domain-specific problems.

View this CV online at *nathawkins.info*

EDUCATION

2019 | Present

PhD. Student, Computational Biology

Department of Computational Mathematics, Science, and Engineering

Michigan State University

- Applying natural language processing methods for analyzing biomedical text
- Engineering Distinguished Scholar
- Rasmussen Fellow

2014 | 2018

B.S., Physics (Minor Computational Science)

Department of Physics And Astronomy

Michigan State University

- Board of Trustee's Scholar

RESEARCH EXPERIENCE

2019 | Present

Graduate Research Assistant

Department of Computational Mathematics, Science, and Engineering

Michigan State University

- Applying natural-language-processing-based machine learning models to systematically annotating free-text descriptions
- Utilizing high-performance computing resources to analyze large amounts of data
- The Krishnan Lab[7]

CONTACT

- hawki235@msu.edu
- nat_hawkins_
- github.com/nathawkins
- nathawkins.info
- (269) 823 - 2741

SKILLS

Highly experienced in

- Python
- Bash
- C/C++

Experience with

- OpenMPI
- CUDA
- R
- SQLite

Last updated on 2020-08-20.

2018 | 2019

Curriculum Developer and Educational Researcher

Department of Computational Mathematics, Science, and Engineering

Michigan State University

- Conducted research interviews with experts in the field of computational science to understand practices and key concepts to broadly inform the development of future curricula.
- Performed comprehensive review of department's existing undergraduate computational modeling and data science curricula.
- Created course materials on introductory python programming (e.g. numpy arrays, version control in git, agent-based modeling using python class, etc.).

2017 | 2018

Undergraduate Researcher

Piermarocchi Group

Michigan State University

- Developed algorithm to determine "best" number of clusters in single-cell RNA sequencing data by calculating adjusted rand index of repeated trials as a measure of internal consistency.
- Applied algorithms and methods from statistical physics (e.g., the Hopfield model) to gene expression data to model the cell cycle and other attractor-based systems.
- Used virtual image creation software (Docker) to build and execute models on high performance cloud computing platforms.

2015 | 2017

Undergraduate Researcher

Physics Education Research Lab (PERL)

Michigan State University

- Researched students' perceptions of computational modeling for learning introductory physics.
- Developed instructional computational models and exercises for introductory electromagnetism physics course (e.g., 3D model of an electric field in space due to a series of point charges).
- Consultant on the use of scikit-learn for analysis on nation-wide survey focused on understanding proliferation of computation in Physics programs.

INDUSTRY EXPERIENCE

2016

Companion Animal Research Intern

Zoetis Animal Health

Kalamazoo, MI

- Worked on vaccine development studies for canine influenza.
- Primary responsibilities included data analysis and verification, study documentation, and conducting experimental procedures.

TEACHING EXPERIENCE

2017 | 2018

Undergraduate Learning Assistant

Department of Physics And Astronomy — Michigan State University

- Primary instructor for twelve students in project-based group-learning environment.
- Developed course materials to teach introductory computational modeling and physics-based simulations.
- Graduate level class

2017

Undergraduate Learning Assistant

Department of Mathematics — Michigan State University

- Lectured, developed assessments and assignments, and graded for undergraduate pre-calculus course.
- Tutored differential equations and multivariable calculus in Math Learning Center at Michigan State University.

PUBLICATIONS, POSTERS, AND TALKS

2020

Systematic tissue annotations of genomic samples by modeling unstructured metadata

ISMB 2020 — Michigan State University

- Poster.

2019

Polled Digital Cell Sorter (p-DCS): Automatic identification of hematological cell types from single cell RNA-sequencing clusters

BMC Bioinformatics

- Third author.

2019

Building Foundations for Education Research in the Department of CMSE

Department of Computational Mathematics, Science, and Engineering — Michigan State University

- Invited Talk.

2019

Building Foundations for Education Research in the Department of CMSE

CREATE4STEM Conference — Michigan State University

- Poster.

2019

Connecting Education and Practice: Using Expert Interviews to Evaluate and Reform Computational Science Curriculum

STEM Alliance Research Expo — Michigan State University

- Poster.

2017

Examining Thematic Variation in a Phenomographical Study on Computational Physics

Physics Education Research Conference, Proceedings

- First author.
- Proceedings of largest national conference for physics education researchers.

2017

Understanding Student Perceptions of Computational Physics Problems in Introductory Mechanics

American Association of Physics Teachers — Cincinnati, OH

- Poster.

2016

Towards Understanding Students' Development of Computational Modeling Ideas in an introductory Mechanics Course

Undergraduate University Research and Arts Forum — Michigan State University

- Poster.

HONORS AND AWARDS

2019

Rasmussen Doctoral Recruitment Award[2]

The Graduate School — Michigan State University

- Fellowship awarded to outstanding new and prospective students pursuing graduate studies at Michigan State University.
- Only recipient from College of Engineering in 2019.

2019

College of Engineering Distinguished Scholarship[3]

College of Engineering — Michigan State University

- Recruitment award for outstanding new and prospective students graduate studies at Michigan State University.

2018 | 2019

Dr. Thomas H Osgood Award[4]

Department of Physics And Astronomy — Michigan State University

- Award for outstanding graduating senior in physics and astronomy.

2018

College of Natural Science Alumnus of Future Distinction

College of Natural Science — Michigan State University

- Awarded to outstanding graduating seniors in the College of Natural Science.

2018

Outstanding Undergraduate Learning Assistant

Department of Physics And Astronomy — Michigan State University

- Department award for most outstanding undergraduate instructor.

2018

Board of Trustees' Scholarship

Michigan State University

- Awarded to undergraduate students graduating with a 4.0 GPA.

2018

Michigan State University Outstanding Senior

Michigan State University

- Award for outstanding graduating senior nominated by Michigan State University faculty.
- Only recipient to have been nominated by two faculty members.

2017

Dr. Bruce Verwest Award[5]

Department of Physics And Astronomy

Michigan State University

- Awarded to outstanding junior in the Department of Physics and Astronomy.
- Only recipient in 2017.

2016 | 2017

Lawrence W. Hantel Endowed Fellowship[6]

Department of Physics And Astronomy

Michigan State University

- Fellowship awarded to fund projects proposed by undergraduate students and their mentors.

PROFESSIONAL MEMBERSHIPS

2020 | Present

International Society for Computational Biology

La Jolla, CA

- https://www.iscb.org/

2019 | Present

Society for Industrial and Applied Mathematics

Philadelphia, PA

- https://www.siam.org/

COMMITTEE MEMBERSHIPS

2019

Undergraduate Data Science Curriculum Team

Department of Computational Mathematics, Science, and Engineering

Michigan State University

- Responsible for outlining program- and course-wide learning goals, learning objectives, and content for the College of Natural Science's undergraduate data science degree program.

2018

Committee for Computational Physics at the Physics and Astronomy Department at Michigan State University

Department of Physics And Astronomy

Michigan State University

- Responsible for developing and implementing a long-term plan for coherent integration of computational modeling concepts at all levels of undergraduate physics degree program.

SERVICE

2020 | Present

Department of Computational Mathematics, Science, and Engineering Graduate Student Organization Student Liaison

Department of Computational Mathematics, Science, and Engineering

Michigan State University

- Responsible for attending Graduate Study Committee meetings on behalf of all graduate students.
- Provide feedback and input on curriculum decisions, qualifying exams, scholarship awards, and new student enrollment.
- Actively contribute to department-wide Divserity, Equity, and Inclusion efforts.

2014 | Present

Lions Club International

Mattawan, MI

- Community service focused on providing vision aids to those in need[7]

LINKS

1: https://www.thekrishnanlab.org
2: https://grad.msu.edu/rasmussen-doctoral-recruitment-awards
3: https://www.egr.msu.edu/graduate/engineering-distinguished-scholars
4: https://web.pa.msu.edu/alumni/awards/osgood_awards.html
5: https://web.pa.msu.edu/alumni/awards/verwest_awards.html
6: https://web.pa.msu.edu/alumni/awards/hantel_awards.html
7: https://lionsclubs.org/en