

MYSON C. BURCH

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EXPERIENCE

IBM Research

May 2023 – Present

Research Scientist

Developing tools using artificial intelligence and quantum technologies to aid in the acceleration of scientific discovery in health.

May 2022 – August 2022

Computational Genomics Intern

Address high dimensional genomics-related questions through mathematical modeling, statistical methodologies, combinatorics, and scalable algorithms.

Cummins IT

May 2021 – August 2021

Data Science / Analytics and AI Intern

Contribute to the company's ability to perform real time condition monitoring, enable process improvement, and maintain machine health using deep learning, big data analytics, computer vision and NLP methods.

Design strategic tools, prototypes, and software to mitigate costs of reactive repairs, repetitive inspections, and unscheduled issues in manufacturing and product development using a proactive monitoring system. Implement solutions and communicate feedback to key stakeholders during regulatory meetings.

Purdue University

August 2017 – August 2023

Research Fellow & Teaching Assistant

Develop innovative techniques at the intersection of technology and life sciences using biobank scale data from GWAS studies and machine learning as an effort to better understand human health and disease.

Collaborate with an interdisciplinary lab to engineer technical solutions and analysis for complex quantitative genomics problems involving large datasets that contribute to precision medicine and advance the healthcare industry.

Teach 400+ undergraduates and aid in developing their programming, statistics, and analytical skills. Demonstrated written, communication and conflict resolution skills as a teacher. Work collaboratively with other RAs.

PUBLICATIONS

- *CluStrat: a structure informed clustering strategy for population stratification*, RECOMB (2020), BMC Bioinformatics (2023)
- *MaSk-LMM: a matrix sketching-based fast and scalable linear mixed model for association studies in large biobanks*, ASHG (2022), RECOMB (2024), Genome Research (2024) under review
- *Predicting complex disorders by combining comorbidity data and polygenic risk scores*, ISMB (2022), RCHE Summit (2022)

EDUCATION

Purdue University

PhD in Computer Science

August 2017 – August 2023

Indiana University-Purdue University
of Indianapolis

B.S. in Computer Science

B.S. in Applied Mathematics

August 2013 – May 2017

INTERESTS

- DATA SCIENCE
- STATISTICAL GENETICS
- AI
- QUANTUM
- BIOINFORMATICS

COMPUTATIONAL SKILLS

- PYTHON, R, SAS
- JAVA
- C, C++
- JULIA, MATLAB
- SQL

GRANT WRITING

- NSF GRADUATE FELLOWSHIP
- FACEBOOK FELLOWSHIP
- BLOOMBERG FELLOWSHIP
- NIH PREDOC. FELLOWSHIP

- *Polygenic risk scores based on European GWAS correlate to disease prevalence differences around the world, medRxiv (2021)*
- *Can polygenic risk scores help explain disease prevalence differences around the world? A worldwide investigation, BMC Genomic Data (2023)*
- *Mentoring Black Teens During National Pandemics: Mutually Beneficial Service, PJSL and International Engagement (2021)*
- *Assessing the hemodynamic contribution of capillaries, arterioles, and collateral arteries to vascular adaptations in arterial insufficiency, Microcirculation (2020)*
- *Modeling Acute Blood Flow Responses to a Major Arterial Occlusion, Microcirculation (2020)*

LEADERSHIP EXPERIENCE

August 2022 – August 2023

LEAP Fellow – LEAP Alliance at Purdue University

Focus on diversifying future leadership in the computing professoriate to increase diversity across the field of computing.

May 2020 – May 2022

Vice President – Purdue Black Graduate Student Association

Aided BGSA in improving membership and supporting underrepresented minorities in higher education and industry. Helped manage and facilitate the use of an organizational budget of over 30 thousand dollars.

May 2021 – August 2021

Graduate Coordinator – Purdue SROP & Bridge Programs

Was responsible to plan, supervise and implement creative summer program ideas that enrich the virtual experience of the summer participants and staff. Facilitated professional and academic development workshops for underrepresented minority students interested in higher education.

October 2020 – January 2021

Student Ambassador – Purdue Equity Task Force w. the Board of Trustees

Aided in providing recommendations to the University that focus on ameliorating the structural and environmental barriers to success that students, staff, and faculty of color face.

November 2019 – May 2021

Mentor & Tutor – HeadsUp Mentorship Program in Lafayette

Provided local Black teens access to Black role models committed to helping them achieve their goals. Engaged in monthly group and one-on-one sessions with our mentees to provide safe spaces and encourage building life skills and decompress.

August 2019 – May 2020

Undergraduate Outreach Chair – Purdue Black Graduate Student Association

Helped develop and host Grad 101, a graduate school prep workshop for undergraduates applying to graduate school. Recruited and informed undergraduates at Spelman College about graduate studies in Computer Science at Purdue.

May 2019 – Present

Fellowship Mentor – National Science Foundation

August 2018 – August 2023

SOFTWARE & OTHER

- MICROSOFT OFFICE
- ADOBE PHOTOSHOP
- VISUAL STUDIOS
- DATABRICKS
- JUPYTER NOTEBOOK
- PC, MACINTOSH, UNIX

SPOKEN LANGUAGES

- SPANISH (LIMITED WORKING PROFICIENCY)

GRANTS, HONORS, & AWARDS

- RICE FELLOWSHIP IN SCIENTIFIC COMPUTING
- NSF GRADUATE RESEARCH FELLOWSHIP
- DR. DOLORES COOPER SHOCKLEY PRESIDENTIAL SCHOLARSHIP
- DR. LUTHER S. WILLIAMS LEADERSHIP AWARD
- GERALDINE & DAVID RIGDON RISE SCHOLARSHIP
- GENE AND DOROTHY MARRS MEMORIAL SCHOLARSHIP

March 2014 – Present

Judge – Business Professionals of America

PRESENTATIONS

- *MaSk-LMM: a matrix sketching-based fast and scalable linear mixed model for association studies in large biobanks*
 - Poster presentation in American Society of Human Genetics (ASHG) meeting 2022, Los Angeles, CA.
 - Platform presentation at IBM Research in 2022, Yorktown Heights, NY.
- *Predicting complex disorders by combining comorbidity data and polygenic risk scores*
 - Poster presentation in Intelligent Systems for Molecular Biology (ISMB) meeting in 2022, Madison, WI.
 - Poster presentation in Regenstrief Center for Healthcare Engineering Summit (RCHE) held in 2022, West Lafayette, IN.
- *CluStrat: a structure informed clustering strategy for population stratification*
 - Platform presentation in Research in Computational Molecular Biology (RECOMB), held virtually in June 2020.
 - Poster presentation in American Society of Human Genetics (ASHG) meeting 2019, Houston, TX.