curriculum vitæ of
Adam A.C. Burns
adamacburns.com me@adamburns.org
+1 646 883 1603 orcid.org/0000-0002-1630-0273

Experience

Research Experience

Aug. 2021 – Present **Data Engineer** — Division of Biostatistics @ University of Minnesota

Provided key administrative, clinical, and data management support to international longitudinal clinical trials, contributing to the success of global health initiatives. Created efficient programs using Bash, NOMAD, Python, and Oracle, enhancing process improvement and data accuracy. Developed tracking systems for lab inventory and specimen utilization, ensuring the smooth operation and resource management of clinical trials.

Apr. 2023 – Aug. 2023 **Data Scientist Intern** — Carelon Healthcare Services @ Elevance Health

Developed novel transformer model to predict insurance service utilization with an AUC of 0.84 trained on 300K records.

Apr. 2018 – Aug. 2021 **Research Volunteer** — DahariLab @ Loyola University Medical Center

Developed, verified, and validated an agent-based model of hepatitis C virus transmission using AnyLogic. Worked closely with a team of virologists to ensure the model accurately reflected cellular kinetics. Assisted in preparing data, visuals, and various sections of a manuscript slated for 2023 publication.

Jan. 2019 – Nov. 2021 **Research Volunteer** — PETM @ Loyola University Medical Center

Designed, verified, and validated an SEIR model to monitor student infection rates during influenza and COVID-19 outbreaks using R. Calibrated the model with observed data using genetic algorithms (*genalg* package) for an accurate reflection of real-world scenarios. Conducted sensitivity analysis to confirm the robustness of results and evaluated the impact of various policies. Assisted in preparing data, visuals, and a manuscript for publication.

Industry Experience

Mar. 2020 – Mar. 2021 **Project Management and Technical Consultant** — The Shelby Group

Spearheaded data integration projects with Fortune 500 companies, overseeing the full process from capturing current state to implementing new strategies. Created project timelines and programmed scripts to facilitate efficient ETL data management. Utilized Python, PostgreSQL, MariaDB, MuleSoft, Coupa, and proprietary API protocols to transition data from silos to data lakes, demonstrating adaptability and proficiency in various tech tools.

Jun. 2016 – Mar. 2020 **Software Engineer** — FactRight, LLC

Engineered and maintained the company's PostgreSQL databases and Excel spreadsheets, supporting research and marketing initiatives for alternative securities products. Developed a Power BI dashboard and constructed the accompanying data architecture in AWS to monitor sales and project pipelines in near real-time, demonstrating my ability to leverage technology in streamlining business processes.

Clinical Experience

Jul. 2022 – Present **Clinical Research Volunteer** — University of Minnesota Medical School

Active contributor to the "10,000 Families Research Study," involving participant screening, consent procedures, and data collection, including biometric measures following phlebotomy training. Efficiently managed data entry into REDCap and Oracle databases for subsequent analysis. Developed standard operating procedures (SOPs) and conducted staff training to uphold study protocol adherence, demonstrating leadership and commitment to rigorous research standards.

Jan. 2022 – May. 2023 **Research & Quality Improvement Intern** — Hennepin Healthcare Research Institute

Conducted patient enrollment and data collection as part of clinical research initiatives at a Level 1 Trauma Center and Emergency Department of Hennepin County Medical Center. My role involved active patient interaction and diligent data management, contributing to the efficiency and integrity of the research process.

Other Experience

May. 2022 – Present **Volunteer** Minnesota Farmers' Markets

Actively engaged in community service through participation in two local farmers markets. In the Richfield Farmers Market, responsibilities include educating patrons about seasonal produce, addressing inquiries, and managing the frequent shoppers program check-in process. At the Maple Grove Farmers Market, managed the Power of Produce Kid's Club check-in process for children aged 13 and younger. These roles have provided valuable opportunities to interact directly with diverse community members, bolstering their understanding and appreciation of fresh produce, and reaffirming my commitment to health education and community service.

Sep. 2022 – Apr. 2023 **Volunteer @ Clinics and Surgery Center** University of Minnesota Medical Center

Committed over 100 hours to volunteering, providing essential support to surgical departments through managing sterile equipment and supplies, contributing to the smooth operation of healthcare services.

Education

Sep. 2022 – Dec. 2023 **Non-Degree** in Pre-Health (UG GPA:4.00) Northwestern Health Sciences University

28 UG credits

Jan. 2022 – May. 2022 **Non-Degree** in Graduate Studies (GR GPA:4.00) University of Minnesota

4 GR credits

Sep. 2017 – May. 2020 **Non-Degree** in Computer Science (UG GPA: 3.94, GR GPA: 4.00) University of Illinois

20 UG credits; 8 GR credits

Sep. 2016 – Aug. 2017 **B.S.** in Mathematics (UG GPA: 3.73) Indiana University

Jun. 2013 – May. 2015 **Non-Degree** in Undergraduate Studies University of Minnesota

Exchange student to Korea University in 2014. Transferred to Indiana University East in 2016.

Publications

Authors who equally contributed to a publication are marked with a †.

Journal Publications

1. **Burns AAC**†, Gutfraind A†. Effectiveness of isolation policies in schools: evidence from a mathematical model of influenza and COVID-19. *PeerJ.* 2021. https://doi.org/10.7717/peerj.11211.

1. Delaney M, Telke S A, et al. The BLOODSAFE program: Building the future of access to safe blood in Sub-Saharan Africa *Transfusion.* 2022. https://10.1111/trf.17091.

Works in Progress

1. Shi ZZ†, **Burns AAC**†, Cudone E†, Nicholson C, Graw F, Ozik J, Uprichard SL, Dahari H. Modeling cell-to-cell spread of hepatitis C viral infection in vitro using agent-based modelling approach. *In Preparation.* 2024.

Talks

Invited Talks

1. "Introduction to Mathematical Modeling of Infections"
   Department of Microbiology and Immunology, Loyola University Chicago 2021 (Virtual)

2. "Reducing Influenza Transmission in Schools: Quantitative Analysis of Return-to-School Policies"
   Department of Family Medicine and Community Health, University of Wisconsin-Madison
   2019 (Madison, WI)

3. "Lessons Learned: Computational Modeling of COVID-19"
   The Shelby Group Fall Rally 2020 (Virtual)

Committees

May. 2023 – Present **Co-Chair - Infectious Diseases Committee** Northwestern Health Sciences University

Aug. 2021 – Present **Member - Research Committee** Public Health @ University of Minnesota

Aug. 2021 – Present **Member - Research Committee** Biostatistics @ University of Minnesota

Skills

Techniques

Model calibration/parameter estimation using genetic algorithms, sensitivity analysis, agent-based modeling using AnyLogic, relational databases, optimization, API development, SIR epidemic models, dashboard development, REDCap administration

Programming languages

C/C++, Java, Python, R, Matlab, UNIX Shell Scripting

Platforms

Windows, Linux (Debian)