David Purdum

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Education

Bachelor's of Science
Butler University

Graduated May 2020 · 3.9 GPA
Mathematics Major · Computer Science Major · Statistics Major
Data Science Minor

Research

Computational Number Theory

February 2018 – Present
Implemented and analyzed algorithms for computing the number of distinct integers in the n by n multiplication table. Used OpenMPI and C++ to compute large values of M(n) on Buler University's supercomputer.

Polynomial Rings

August 2019 – January 2020
Studied the automorphisms between polynomial rings of 2 variables. Used sagemath to classify automorphisms that fix families of polynomials.

Data Structures

June 2019 – February 2020
Implemented various versions of the multiselection problem. Benchmarked the number of array comparisons needed to perform various sorting and selection algorithms.

Publications

Work in Progress

"Algorithms for the Multiplication Table Problem"
Richard Brent, Carl Pomerance, David Purdum, Jonathan Webster
https://arxiv.org/abs/1908.04251

Experience

Data Scientist
Eli Lilly and Company

June 2020 – Present
Will begin work in June 2020.

Developer
Eli Lilly and Company

Summer 2019
Wrote image processing scripts in Python for optical character recognition. Trained machine learning models for image classification. Metadata extracted from images are indexed in an internal search engine.

Software Engineer
Ontario Systems

Summer 2018
Wrote tests and fixed bugs on accounts receivable software. Worked with legacy code and practiced Kanban. Utilized virtual machines for testing environments.

Presentations

January 2020 Poster

"Automorphisms of Integral Polynomials and Their Stabilizers"
Joint Mathematics Meetings

April 2019 Talk

"Calculating M(n) and Optimizing M(n) Algorithms"
Butler Undergraduate Research Conference

April 2019 Talk

"GuideDawg 2.0: Butler's Mobile Application for the Blind and Visually Impaired"
Butler Undergraduate Research Conference

July 2018 Poster

"Computing M(n)"
Algorithmic Number Theory Symposium

Projects

Healthy Horizons — Developed full-stack Node.js site for Butler University's Healthy Horizons program. Allows users to submit weekly wellness habits and administrators to monitor those submissions.

GuideDawg — Designed an API to communicate between MySQL database and Xamarin mobile application. GuideDawg allows those with visual impairments to navigate Butler's campus.

Convert Case — Created a command-line utility and Rust library for converting strings to and from various cases. Created test suite and documented the open-source API.

Awards and Recognition

April 2020	EPICS Award
April 2020	Outstanding Graduating Senior in Statistics
April 2020	2020 Outstanding Senior in Computer Science
May 2019	Upsilon Pi Epsilon Honor Society
April 2019	Kai Neilson Award
May 2018	Kappa Mu Epsilon Honor Society