Brian Wheatman

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EDUCATION

Johns Hopkins University (JHU)   Baltimore, MD
PhD Computer Science
Advisors: Yair Amir and Randal Burns
Gordon Croft Fellow

Massachusetts Institute of Technology (MIT)   Cambridge, MA
Master of Engineering in Computer Science and Engineering   June 2019
Concentration in Systems
GPA: 5.0/5

Massachusetts Institute of Technology (MIT)   Cambridge, MA
Bachelor of Science in Computer Science and Engineering   June 2017
Bachelor of Science in Mathematics
Minor in Economics - Minor in Management Science

RESEARCH EXPERIENCE

MIT Computer Science and Artificial Intelligence Laboratory (CSAIL)   Cambridge, MA
Master of Engineering Thesis with Prof. Charles Leiserson in Performance Computing   Sep 2017 - Jun 2019
- Improved an image processing pipeline containing petabytes of images with approximate locations to create a single, large mosaic with accurate locations
- Decreased time and resource requirements, allowing the pipeline to run on a single machine, instead of a cluster

MIT Computer Science and Artificial Intelligence Laboratory (CSAIL)   Cambridge, MA
SuperUROP Researcher with Prof. Daniela Rus and Prof. Sertac Karaman   Sep 2016 – Jun 2017
- Designed and implemented a new, online algorithm for a NP-Hard variant of the Traveling Salesperson Problem, which enables solutions to be found ten times faster than the current approach

MIT Human Dynamics Laboratory at MIT Media Laboratory   Cambridge, MA
Undergraduate Researcher with Prof. Alex (Sandy) Pentland   Sep 2015 – Jun 2016
- Modeled energy use given data from mobile phone records using machine learning, particularly clustering algorithms, to be used by the country of Andorra for predicting energy needs
- Created predictive models for population movement using mobile phone records
- Presented results at and was published in the conference proceedings for SBP-BRiMS 2016

MIT Sloan School of Management   Cambridge, MA
Undergraduate Researcher with Prof. Stephen Graves   Feb 2014 – Aug 2014
- Designed and developed a program for simulating a user-specified production line, including raw materials, intermediaries, finished goods, costs, and time constraints to be used as a visualization and teaching tool

TEACHING EXPERIENCE

Teaching Assistant for Computation Structures (6.004)   Spring and Fall 2018
- Teach an introduction to computer structures from combinational logic to parallel systems

Teaching Assistant for Seminar in Undergraduate Advanced Research (6.UAR)   Fall 2017
- Advise undergraduates and lead section to help prepare undergraduates for their senior projects

Lab Assistant for Introduction to Digital Communications (6.02)   Fall 2016
Tutor for Introduction to Algorithms (6.006)
Tutor for Design and Analysis of Algorithms (6.046)
Grader for Introduction to Algorithms (6.006) and Design and Analysis of Algorithms (6.046)

PROFESSIONAL EXPERIENCE

Google   Various, USA
Software Engineering Intern   Summer 2019
- Designed a machine learning model for use in a proprietary, truth inference problem
- Implemented the truth inference model and a distributed pipeline for preprocessing the data

Software Engineering Intern   Summer 2018
- Worked on Akaros, a new operating system for high performance and real time applications
- Developed a port of the Go programming language to run on Akaros

Software Engineering Intern   Summer 2017
- Enhanced a large, Map-Reduce data processing pipeline used to aggregate and report advertising data
- Created software cache for fast access to critical path metadata stored in slow storage

Five Rings Capital   New York, NY
Software Engineering Intern   January 2017
- Conducted an evaluation of different database solutions on the basis of cost, scalability and ease of use
- Reduced memory requirements for the cloud database by at least four times and of individual queries by orders of magnitude by structuring data, making the cloud database cheaper than a local one

Facebook   Menlo Park, CA
Data Engineering Intern   Summer 2016
- Created pipelines to collect and organize third party data to be used for business intelligence purposes
- Worked with multiple, large databases using several database engines, including Oracle and Hive
- Created self-documenting code that generates textual and visual aids to help understand the pipeline

JP Morgan Chase & Co.   New York, NY
Software Engineering Intern   Summer 2015
- Designed and implemented an automated testing process for a large, transaction system with nightly generated statistics and visualizations of performance (up to 10 million data points added daily)
- Created a website with dynamically generated pages to display results of the tests and long term trends

PAPERS, PRESENTATIONS AND PUBLICATIONS

Wheatman, B. (2019). Image alignment and dynamic graph analytics: two case studies of how managing data movement can make (parallel) code run fast (Dissertation, Massachusetts Institute of Technology).
https://dspace.mit.edu/handle/1721.1/123023

Wheatman, B., & Xu, H. (2018, September). Packed Compressed Sparse Row: A Dynamic Graph Representation. In 2018 IEEE High Performance extreme Computing Conference (HPEC) (pp. 1-7). IEEE.
https://ieeexplore.ieee.org/abstract/document/8547566

Wheatman, B., Noriega, A., & Pentland, A. (2016). Electricity Demand and Population Dynamics Prediction from Mobile Phone Metadata. In *Social, Cultural, and Behavioral Modeling: 9th International Conference, SBP-BRiMS 2016, Washington, DC, USA, June 28-July 1, 2016, Proceedings 9* (pp. 196-205). Springer International Publishing
https://link.springer.com/chapter/10.1007/978-3-319-39931-7_19

Kaler, T., Wheatman, B., & Wooders, S. (2019, February). High-throughput image alignment for connectomics using frugal snap judgments: poster. In Proceedings of the 24th Symposium on Principles and Practice of Parallel Programming (pp. 433-434). ACM.
https://dl.acm.org/citation.cfm?id=3301495

Tourist Path Optimization Problem (SuperUROP Paper for Senior Project in EECS Major)
http://web.mit.edu/wheatman/www/Tourist_Path_Optimization_Problem.pdf

Anti-magic and Edge Graceful Graphs (Paper for Senior Project in Math Major)
http://brianwheatman.com/Anti_magic.pdf

AWARDS AND HONORS

- Lockheed Martin Undergraduate Research and Innovation Scholar
- Member of Eta Kappa Nu (Computer Science Honor Society)
- Member of Tau Beta Pi (Engineering Honor Society)
- Boy Scouts of America Eagle Scout