Zachary Eichenberger

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Education

University of Michigan, Ann Arbor — Expected Graduation: May 2024
Master of Science in Computer Science — *GPA 4.0*

- Relevant Coursework: Information Retrieval, Databases, Advanced Computer Vision, Cryptography, Generative AI systems, Ethics in AI and Robotics, Algorithms, Machine learning theory, Compilers

University of Michigan, Ann Arbor — Graduated: May 2023
Bachelor of Science in Computer Science, Minor in Mathematics — *GPA: 3.9*

- Relevant Coursework: Natural Language Processing, Differential Equations, Machine Learning, Computer Science Theory, Numerical Methods, Compilers, Discrete Mathematics, Linear Algebra, Software Engineering

Experience

Undergraduate & Graduate Researcher — Sept. 2022 – Present
University of Michigan, LAUNCH lab — *Ann Arbor, MI*

- Lead year–long project to boost Large Language Model coherence and fluency via novel decoding algorithms.
- Analyzed data, developed hypotheses and experiments using GPT 2 and 3, communicated these results within research group on weekly basis.

Research Intern — May. 2022 – Aug. 2022
IBM Research, Scalable Knowledge Intelligence Team — *San Jose, CA*

- Worked closely with adjacent research teams, producing biweekly reports to identify and patch weaknesses in IBM PDF understanding tech.
- Created novel text-image-fusion algorithms for IBM table identification and extraction, reducing error rate within IBM Table Extraction by 60%.

Undergraduate & Graduate Researcher — Jan. 2022 – Present
University of Michigan, Future of Programming Lab — *Ann Arbor, MI*

- Invented novel methods for code generation, operating directly on abstract syntax tree (AST) for improved robustness and enforcing correctness invariants using reinforcement learning model and graph neural nets
- Created weekly reports using WandB, and presented findings updates and reccomendations at biweekly meeting.
- Engineered strongly typed interpreter from the ground up in OCaml, with recursive editing system.

Intern & Intern Cohort Leader — May. 2021 – Aug. 2021
IBM Research — *San Jose, CA (Remote)*

- Designed and ran months-long experiment evaluating noise-robust learning and dataset cleaning algorithms using Pytorch and Scikit-learn; trained and evaluated 100+ models on NLP datasets
- Created dataset cleaning module for Open-source project, Text Extensions for Pandas. Made 100+ commits, and became #4 contributor on project
- Created state of the art dataset error detection algorithms using novel clustering approach to detect systematic errors present in dataset labels, resulting in significant boost over previous methods.

Research Assistant — January 2021 – June 2021
Smart and Sustainable Automation Lab — *Ann Arbor, MI*

- Developed low-cost 3d printer fault detection sensor. Co-inventor on pending patent, and Co-author on paper.

Intern — May. 2020 – Aug. 2020
IBM Research — *Ann Arbor, MI*

- Independently developed portion of Open-source library (in Python) to ingest data from scanned tables
- Automated regression testing using Travis CI and documentation using Sphinx Auto documentation

Technical Skills

Programming Languages: Python, C++, OCaml, Golang, SQL, Java, JavaScript, Matlab
Skills: Unix Systems, Docker, Git — Centralized and Integration manager workflows, Sphinx Auto-documentation, Travis CI, JUnit, Pytest, PyTorch, Tensorflow, Scikit-learn, Langchain