

ISHAAN NARAIN

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EDUCATION

Northwestern University | McCormick School of Engineering

Evanston, IL

Master of Science in Computer Science | GPA: 3.92/4.00

Jun 2023

Bachelor of Science in Mechanical Engineering | GPA: 3.83/4.00

Jun 2022

- **Honors:** 3x Dean's List Honors and 2x High Honors Recipient
- **Relevant Courses:** Statistical Pattern Recognition, Machine Learning, Financial Mathematics, Algorithm Design, Kernel Hacking, Operating Systems, Multivariable Calculus, Linear Algebra, Differential Equations, Non-linear Control, Numerical Methods

WORK EXPERIENCE

Northwestern University

Evanston, IL

Graduate Systems Researcher | Prescience Lab

Jun 2023 – Present

- Prototyping custom memory management kernel module in Linux with theoretical 230% acceleration of database applications
- Porting kernel modules from Linux 3.x to 5.19 and testing on Ubuntu QEMU with kernel GDB tools, Kprobe, and Ftrace
- Generating source-to-source compiler from SQL to relational algebra in C for applications in parallelization
- Researching and prototyping numerical and exception fuzzing tools to measure robustness of applications during runtime

Graduate Robotics Researcher | Robotics Lab

Jan 2023 – Present

- Creating statistical reinforcement learning C++ library with optimal control for non-linear robotics applying information theory
- Proved demonstration-learning algorithm using 8 positive and 6 negative sample gaussians in dynamic pendulum-swing simulator
- Programmed generalized dynamics and control interface using Jacobian linearization of state with C++20 template class
- Derived mathematics for optimal control via gradient descent by solving Riccati equations from derivative of objective function

Machine Learning and MLOps Research Developer | Center for Deep Learning

Sep 2022 – Dec 2022

- Programmed and presented automated statistical stress-testing-module for Neural Networks to TransUnion and NVIDIA
- Developed stateless full-stack app to monitor of over 20 ML KPIs, leveraging TensorFlow, MongoDB, and Kubernetes
- Maintained robust code through 100% documentation, try-except error handling, git version control, and pull request reviews

Tesla

Palo Alto, CA

Software Engineering Intern | Electrical Systems

Sep 2022 – Dec 2022

- Developed and deployed software and firmware for 16 vehicle display variants by engineering and debugging features in C
- Expanded coverage and scalability of testing framework for 300 firmware tests by refactoring 10,000 lines of legacy Python code
- Resolved 3 display consumer issues by analyzing device registers on I2C and compiling 1000-hour data with multithreaded scripts

Technical Program Manager Intern | Battery Manufacturing

Jun 2021 – Dec 2021

- Managed installation, commission, and 0-to-600-unit ramp of 47-station 90MM manufacturing line for vehicle battery product
- Launched \$1MM R&D line within 4 weeks by creating project plan and coordinating execution between team of 26 engineers

InfernoGuard - NU Startup Garage

Chicago, IL

Machine Learning Engineer

Jun 2022 – Sep 2022

- Spearheaded fire risk classifier and machine learning pipeline for 18 geo-features, achieving 97% accuracy with gradient-boosting
- Automated pipeline to fetch and clean 700GB of image data to classify risk of properties using REST APIs, NumPy, and Pandas

TECHNICAL PROJECTS

Robotics Sensing Navigation and Machine Learning

Jan 2023 – Mar 2023

- Created C++17 robotics library for Extended Kalman-filtered simultaneous localization and mapping using Armadillo matrix-lib
- Automated deployment, documentation, and testing of 10,000-line library using Git, CMake, Doxygen, and Catch2 Framework

DeepQ Financial Trading Decisions

Jul 2022 – Sep 2022

- Implemented deep Q-learning research paper outperforming S&P growth by 18% using Python NumPy, Pandas, and TensorFlow
- Reduced processing time by 82% using multithreading and multiprocessing functions, executing bash scripts in computing cluster

SKILLS AND INTERESTS

Programming: C++ (STL, MPI), C, Python (NumPy, Matplotlib, Pandas, PyTorch), Matlab, SQL, ASM (x86)

Technologies: Git, Linux, GDB, Bash, Serial, CMake, Make, QEMU, Virtual Machines, Kubernetes, Docker, OOP, Multithreading

Interests: Hong Kong Dragon Boat Racing, Acoustic and Electric Guitar (14 years), Catan, Poker, Formula 1