ISHAAN NARAIN

ishaannarain2022@u.northwestern.edu | +1 331-254-9003 | www.linkedin.com/in/ishaan-k-narain/

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 floating-point virtual machine written in C from Linux 3.x to 5.19 and testing on Ubuntu QEMU with kernel GDB tools
- Generating source-to-source compiler from SQL to relational algebra for application in parallelization language framework
- Researching and prototyping numerical and exception fuzzing tools to evaluate accuracy of floating point in scientific simulations

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