Ronghao Ni

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Location: Pittsburgh, PA

Education

- **Carnegie Mellon University** — Pittsburgh, PA
  Master of Science in Information Networking; GPA: 4/4 — *Jan 2022 - Dec 2023*
  *Admitted into **Applied Advanced Study track**, ongoing thesis topic: GANs for test cases generation*
  ***Completed and ongoing courses:** Introduction to Computer Systems (14513), Introduction to Machine Learning (10601), Introduction to Deep Learning (11-785), Storage Systems (15-746)*
- **Hong Kong Baptist University** — Hong Kong S.A.R.
  Bachelor of Science in Computer Science; cGPA: 3.81/4, Ranking: top 2% — *Aug 2016 - Jul 2020*
  ***Honors:** Scholastic Awards (top 2%), Admission Scholarships (top 4%)*
- **McGill University** — Montreal, QC
  Exchange, Computer Science; GPA: 3.92/4 — *Sep 2019 - Dec 2019*

Experience

- **Carnegie Mellon University, CyLab** — Pittsburgh, PA
  Research Intern: GANs for software test cases generation (GAN-based fuzzing) — *May 2022 - Aug 2022*
  - **Contribution**: Researched SOTA GAN-based **fuzzing**. Solved compatibility issue of **RareGAN** with **TF** 2.X and long outputs generation problems. Constructed an edge coverage testing backend for **AFL** and **LLVM** instrumented binaries. Formulated metrics of 'rareness' to direct RareGAN to generate high coverage seeds.
  - **Result**: Accelerated old backend **29x** (on average) for coverage testing tasks. Pushed GAN to generate seeds that can trigger **deeper** paths with designed metrics (compared with plain edge coverages)
- **MXNavi Ltd.** — Shenyang, China
  Software Engineer Intern: Autostereoscopic display for in-dash car navigation system — *May 2021 - Dec 2021*
  - **Project**: Feasibility verification of autostereoscopic display for car navigation system.
  - **Implementation**: Deployed **OpenGL** in **C** for graphical rendering and **MediaPipe** for eyes tracking. Manipulated Framebuffer to mix both eyes view. Rebuilt demo app in **Unity** for modern UI with customized dual-map shader to combine views from both eyes and updated view frustum based on eyes location to stabilize objects' positions.
  - **Impact**: **Completed** demonstrations for feasibility assessments and as a **basis** for future iterations
- **Neusoft Corp.** — Shenyang, China
  Algorithm Engineer Intern: Efficient algorithms for lung CT images segmentation — *Jun 2020 - Sep 2020*
  - **Project**: Devised algorithms for Neusoft's Carevault Research Cloud Platform for medical annotations on CT images.
  - **Implementation**: Designed algorithms based on Canny edge detector with end-point connection algorithm to increase robustness and reduce noises. Improved algorithm's performance for immediate reactions. Filtered detected regions with decision trees. Implemented as a **3D Slicer** plugin with **OpenCV** and **ITK** in **Python**.
  - **Impact**: Achieved **10.6%** precision and **42.5%** recall increasing (compared with vanilla Canny edge detector.) Deployed at **4 of top 100** hospitals in China as a package of Neusoft's Feibiao Medical Annotation Platform.
- **Hong Kong Baptist University** — Hong Kong S.A.R.
  Research Intern: Computer-aided clinical skin disease diagnosis using CNN — *May 2018 - Sep 2019*
  - **Contribution**: Web-crawled with **Python** and **Selenium** to collect more than 3,000 skin diseases clinical images in 10 classes to initiate the early stage of research. Investigated poor training results with 2 SOTA **CNN models** (NASNetMobile, and PNASNet) with **PyTorch**.
  - **Result**: **Coauthored paper** published in *2019 IEEE International Conference on Big Data (Big Data)*, entitled "Computer-aided clinical skin disease diagnosis using CNN and object detection models."

Projects

- **Event Management System (Web application, Individual course project)**: A web application supporting events viewing, registration, and participants management. Later immigrated to Android platform with Ionic framework.
  Tech: HTML, JavaScript, Sails.js, Mongo DB, Ionic
- **ATMSS: an Automated Teller Machine Simulator System (Software Engineer, Group Course Project)**: Developed a concurrent (different hardware components run on different threads) ATM simulator with GUI, supporting basic ATM functions. Different exceptions are appropriately handled to preserve consistency.
  Tech: Java, JavaFX, PHP
- **A Simple Fully Connected Neural Networks Framework (GPU & Parallel Computing, Individual Course Project)**: Built from scratch a FCNNs framework supporting customized network structures for training and inference on GPUs and on multi-core CPUs.
  Tech: C++, CUDA C, OpenMP

Skills

- **Programming Languages**: Java, C/C++, Python, SQL, OCaml
- **Frameworks and Tools**: AWS, CUDA C, Hadoop, LaTeX, Linux Bash, PyTorch, TensorFlow, OpenCV