Melissa Pan

Pittsburgh, PA, United States, 15213 | 412-708-6280 | zhiyangp@andrew.cmu.edu | linkedin.com/in/zhiyang-pan-melissa/

EDUCATION

Carnegie Mellon University (CMU) | *Pittsburgh, PA*   **Expected Graduation: 06/2024**
Master of Science in Electrical and Computer Engineering – Applied Study with Research Track, *GPA 4.0/4.0*
- Selected coursework**:** Cloud Computing (15-619), Modern Datacenter Computing (18-748), Computer Systems (18-613)

University of Toronto (U of T) | *Toronto, Canada*   **Graduation Date: 06/2020**
Bachelor of Applied Science in Electrical and Computer Engineering, High Distinction, *Core GPA 3.83/4.0*
- *Engineering Business Minor; AI Certificate*; **Faculty of Engineering Dean's Honored List:** 2015-2020

SKILLS

Languages: C++, C, Python, Java, SQL, Scala, Shell, Perl, Javascript, XML, Verilog/Assembly, TensorFlow, JAX, MLIR, HTML
Systems: Db2, MySQL, Spark, Kubernetes, AWS, Azure, GCP, ETL, UNIX, Windows, GIT, GitHub, VSCode, Xcode, MongoDB

PROFESSIONAL EXPERIENCE

Software Engineer Intern | **Google** | *Sunnyvale, CA*   **05/2023 - 08/2023**
- Designed and implemented **NCCL GPU** collective clustering optimizations end-to-end using **C++** in Tensorflow API enabling up to **5% speed up** and **80% reduction in GPU on-device idle time** for **Large Language Models (LLM)**: BERT and T5
- Formulated and conducted 180 training experiments on 5 types of **transformers** and or models in **Python** to profile optimization outcomes; Crafted comprehensive performance study report from analysis of the experiment result
- Authored **design documentation** independently from extensive research on state-of-the-art literatures in distributed computing, previous design documentation and proactive engagement in design discussions with technical leads

Software Engineer | **IBM** | *Markham, Canada* (**Manager's Recognition Award 2020**)   **05/2020 - 12/2022**
- Spearheaded end-to-end software development of two new features independently to handle tablespace failure during backup and recovery in **Db2 v11.5.7,** and to optimize storage of recovery objects in **Db2 v12.1**; presented and updated in stakeholder meeting
- Maintained security and stability of the **C++ code** for **Db2 core engine** in **Backup, Restore and Recovery** (BAR) components across six Db2 releases, some core features include: data replication in **distributed** database systems, **log** space management
- Represented BAR domain end-to-end in a **cross-teams** project involving 7 teams from design to implementations; facilitated project lead to drive progress for other teams by providing technical consultations on code migration and infrastructure
- Refactored and modernized entire domain's **488 test sets** from IBM clearcase to **GIT** by developing new set of testing APIs in Perl
- Initiated and carried out an end-to-end distributed infrastructure automation project resulting in **75% reduction** of manual effort
- Troubleshooted support tickets and skills' cases as BAR domain expert, achieving **100%** resolution within expected time
- Mentored student interns for 16 months, facilitating their intern project, providing Db2 training sessions and holding sync meetings
- Led daily sync meeting using **Agile development** practices for a team of six for 8 months in the absence of a direct manager

System Designer & Team Lead **|** IBM - *Patent & Jumpstart Program* (**Judges's Choice Best Project Award**)   07/2020 - 06/2022
- Authored **patent disclosures** and **invention publications** on ranked based setup and execution of federated learning, and redaction of sensitive enterprise data, publication: https://priorart.ip.com/IPCOM/00270087D, https://priorart.ip.com/IPCOM/00270088D
- Orchestrated a team of six to implement design thinking principles while building an application layer between Federated Learning on **Cloud Pak For Data** and **Db2** in **Python** at a coding competition

Backend Developer & Team Lead | **BeenThere** - **Harvard Innovation Lab** | *Cambridge, MA (Remote)*   **06/2020 - 09/2020**
- Developed backend infrastructure for using **Spring, Spring MVC, and MySQL** for a seamless integration with existing frontends
- Designed relational database system in **MySQL** with optimized **schemas** to streamline ML training in psychology research
- Led migration process of the entire domain from WordPress to **Amazon AWS** and conducted analysis on various cloud providers

Software Engineer (Professional Experience Year) | **IBM** | *Markham, Canada*   **05/2018 - 09/2019**
- Participated in redesign of VARCHAR **data structure** for **Db2 blu acceleration** leading up to **66% runtime memory reduction**; Implemented major APIs in **C++** integrated with 200+ referencing functions in the source code
- Developed and managed a new **testing framework** with primary **functional verification tests** in **Perl** for a new feature in Db2 led to a 10% total speed enhancement and covered **SQL** commands in 12 categories with 25 data types

RESEARCH

Research Student Associate | Advisor: Steve Mann, U of T | *Visual Memory Prosthetic for Prosopagnosia*   **08/2019 - 10/2020**
- Authored and presented IEEE SMC 2020 conference paper "Face Recognition and Rehabilitation: A Wearable Assistive and Training System for Prosopagnosia": https://ieeexplore.ieee.org/document/9283058 https://github.com/melishua/prosopagnosia
- Conducted original research to solve social hardship for prosopagnosia with **machine learning** and **human computer interaction**
- Designed a complete system architecture with two modes being real-time face detection implemented with **BlazeNet** and **FaceNet** in Python, and self-training mode to mimic clinical treatment in Android mobile application built with **Java** and **Android Studio**
- Programmed a customized **eye tracker for pupil detection** in Android, achieving a recognition accuracy of 96% at 0.5 meters for real-time mode, 45% speed improvement for training mode, and 30% accuracy improvement on experiment participants