Xiao Chen

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PLT@Northwestern at Mudd 3418, 2233 Tech Drive, Evanston, Illinois, US

EDUCATION

Northwestern University | Evanston, IL, US · Sep. 2022 – Jun. 2024
M.Sc in Computer Science

- **Coursework**: Programming Languages (A) | Code Analysis and Transformation (A) | Compiler Construction (A) | Dynamics of Programming Languages (A) | Proving Properties of Programs with Mechanized Logic (A) | Advanced Topics in Compilers (A)
- **GPA**: 3.957/4.00

Nanjing University | Nanjing, Jiangsu, China · Sep. 2020 – Jun. 2022
M.Eng in Electronic Information

- **Coursework**: Advanced Computer Network (90) | Software Engineering Management (93) | Linux System Foundation (94) | Advanced Software Design (93) | Cloud Computing (100) | Advanced Human-Computer Interaction Techniques (96) | Advanced Algorithm (95) | Software Quality Assurance (97)
- **National Scholarship for Postgraduates** (1%, Oct. 2021)
- **GPA**: 4.58/5.00

Nanjing University | Nanjing, Jiangsu, China · Sep. 2016 – Jun. 2020
B.Eng in Software Engineering

- **Coursework**: Software Engineering and Computing II (96) | C++ Programming Language (88) | Computer Network (95) | Computer and Operating System (95) | Software Construction (95) | Technology of Database Development (96) | Software Testing and Quality (90) | Software Process and Management (92)
- **First-class People's Scholarship** (5%, Nov. 2019) | **Third-class People's Scholarship** (20%, Nov. 2018/17)
- **GPA**: 4.28/5.00

RESEARCH EXPERIENCE

New Syntactic Techniques for Complete Monitoring · May. 2023 – Present
Northwestern University PLT · *Evanston, IL, US*

- Advisor: Prof. Christos Dimoulas, Northwestern University.
- Worked on complete monitoring, a property that aims to check the total control of semantics over each type-induced communication channel between components in gradually typed programs where typed and untyped code coexist.
- Introduced new syntactic techniques to integrate complete monitoring with existing semantics.
- Worked on a framework that mechanically checks and compares different semantics or language features, along with rigorous proof to show the program behaviors being preserved.
- Developed a new property that ensures no incompatibility shall exist in each value's typing history and checks that the semantics can enforce all type obligations from the typing history.

Privatizer in Parallelizing Compilers · Jan. 2023 – Aug. 2023
Arcana Lab, Northwestern University · *Evanston, IL, US*

- Advisor: Prof. Simone Campanoni, Northwestern University.
- Implemented a new intraprocedural may points-to analysis for NOELLE, a parallelizing compiler system.
- Removed overly conservative loop-carried memory dependencies in the program dependence graph to eliminate unnecessary synchronizations that block parallelization.
- Incorporated this points-to analysis to develop a privatizer, which converts dynamic memory allocations and global variables into local variables while preserving program semantics so that we can unlock more optimizations.
- On a loop-dense benchmark from MiBench that NOELLE achieved no speedup before, the privatizer helped obtain a roughly 3x speedup with an 8-core architecture.

Sketch-based Image Synthesis   Feb. 2020 – Jun. 2020

HCI Lab, Nanjing University   *Nanjing, Jiangsu, China*

- Advisor: Prof. Guihuan Feng, Nanjing University.
- Surveyed the mainstream semantic image synthesis algorithms with their pros and cons thoroughly compared.
- Implemented spatially-adaptive normalization to help preserve semantic information in image synthesis tasks.
- Built a pipeline to generate photorealistic landscape images based on user-sketched semantic segmentation masks, allowing user control over both semantics and style when synthesizing images.

COURSE PROJECTS

FocusHour | *A productivity app*   Feb. 2021 – Apr. 2021

- An app allowing users to grow virtual trees by focusing on daily tasks away from their phones, and show their trees in the real world using augmented reality techniques.
- Heterogeneous visualization of user activities, focus records, to-do lists, and task completion details.
- The highest score and the top creativity award winner in the peer review of more than 100 students.

Orange'S | *Adding new features into an experimental OS*   Mar. 2018 – Jun. 2018

- Enhanced the experimental operating system installed on a Bochs virtual machine, implementing calculation of Fibonacci sequence, file system management, exception handling, and process scheduling.
- Gained hands-on experience with OS design, virtualization, file systems, security, and concurrency.

WORK EXPERIENCE

Tencent Holdings Ltd. | Shenzhen, Guangdong, China   Jul. 2021 – Jan. 2022

iOS Development Intern, Technology Engineering Group

- Developed an iOS multimedia messaging app, taking advantage of the speed of 5G communication technology.
- Designed novel messaging card styles and interaction models to handle multimedia messages.
- Refactored the user guide interface and error detection logic for network connection.

Microsoft Software Technology Center Asia | Suzhou, Jiangsu, China   Jul. 2019 – Oct. 2019

Software Engineering Intern, Speech Recognition Group

- Automated the training process of a speech recognition model for conference scenarios using the Microsoft AEther platform, providing higher computational efficiency.
- Applied Gaussian blur and SG filter to recognition results, improving the accuracy for short conversation scenarios.

TECHNICAL SKILLS

Language Skills: Chinese (native), English (proficient), Japanese (fluent)
Programming: C++, Racket, Swift, Python, LLVM (IR), Redex, Agda, Haskell
Frameworks and Tools: Linux Shell, Vim, LaTeX, Git, HTCondor