

RUIYANG ZHU

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EDUCATION

University of Michigan, Ann Arbor Michigan, United States
Ph.D. in Computer Science and Engineering, Advisor: Z. Morley Mao Aug. 2020 - now

Research interests: Networked Systems, Operating Systems, ML+Systems, Mobile networks

University of Michigan, Ann Arbor Michigan, United States
B.S.E. in Computer Engineering, GPA: 4.00/4.00 Sept. 2018 - May. 2020

Shanghai Jiao Tong University Shanghai, China
B.S.E. in Electrical and Computer Engineering, GPA: 3.73/4.00 Sept. 2016 - Aug. 2020

RESEARCH EXPERIENCE

A pioneering 5G Measurement Study Advisor: Prof. Z. Morley Mao
RoubustNet Group, Computer Science and Engineering, University of Michigan Aug. 2020 - now

- Performed a network-based Radio Resource Control (RRC) parameter inference of current 5G network to understand power consumption of 5G cellular network
- Developed an Exoplayer based Android app to measure the Adaptive Bitrate (ABR) video streaming performance under 5G and studied the implication of 5G network to the Quality of Experience of ABR Streaming

LTE Application Aware Scheduling Algorithm Design Advisor: Prof. Z. Morley Mao
RoubustNet Group, Computer Science and Engineering, University of Michigan May. 2019 - Aug. 2020

- Set up an LTE testbed consisting of an eNodeB running OpenAirInterface software and multiple user devices and implemented a Quality of experience measurement app for video streaming in Android Studio
- Encapsulated important eNodeB parameters such as PRB, CQI and UE throughput in an independent module of the codebase in C
- Developed a fine-grained app-aware scheduling algorithm to improve the resource block allocation method and provide higher QoE to user applications

Development of a Reverse Debugging Method Advisor: Prof. Baris Kasikci
Efeslab, Computer Science and Engineering, University of Michigan Apr. 2019 - Sept. 2019

- Investigated the root cause of bugs in modern popular open-source software systems such as TensorFlow and MySQL from source code
- Reproduced each of the software system bugs in a separate docker container and reached the total reproducible amount over **100**
- Tested reproduced bugs in KLEE symbolic execution engine and correlate the failure with root causes

PROJECTS

A RISC-V Based Superscalar Processor Design Advisor: Prof. Mark Brehob
Computer Science and Engineering, University of Michigan Jan. 2020 - Apr. 2020

- Designed and implemented a fully working RISC-V based two-way superscalar out-of-order processor in SystemVerilog with more than **5.8k LoC**
- Realized the branch stack (a.k.a. early branch resolution) technique to improve the processor's execution speed by **3x** under branch misprediction

Fault-tolerant Distributed System Course: Distributed System
Computer Science and Engineering, University of Michigan Sept. 2019 - Dec. 2019

- Established a Primary/Backup Replicate State Machine framework which can tolerant N machines' failure with N+1 servers in Golang
- Constructed a Paxos-based Key/Value Service API in Golang that can serve clients' key/value requests concurrently during network partition

Operating System & Concurrent Programming Course: Intro to Operating System
Computer Science and Engineering, University of Michigan Jan. 2019 - Apr. 2019

- Implemented a thread library (mutex, cv, etc) in C++ that could be run on linux kernel with user applications

- Developed a memory page management simulation application of the linux kernel by virtual memory translation and clock erase algorithm
- Built a multithreaded network file server by utilizing TCP socket, C++ shared_mutex and AES security protocol

Database Management Project

Course: Database Management System

Computer Science and Engineering, University of Michigan

Jan. 2019 - Apr. 2019

- Wrote SQL scripts to realize potential friend suggestion functionality by retrieving information of users who met certain conditions
- Implemented external merge sort and grace hash join algorithms in C++ to save data processing time and storage space and performed MapReduce method in MongoDB to improve data processing speed

EXTRACURRICULAR ACTIVITY

Orient Futures Cup Statistical Modeling Contest

Shanghai, China

Shanghai Jiao Tong University

Dec. 2017 - Feb. 2018

- Developed a statistic model which classifies different new companies based on business functions
- Constructed a Convolutional Neural Network in python using TensorFlow to realize the model to reach the classification precision up to **93%**

AWARDS

University Honors - University of Michigan

Dec. 2019

University of Michigan Dean's Honor List

Winter 2020, Fall 2019, Winter 2019, Fall 2018

Shanghai Jiao Tong University Undergraduate Excellent Scholarship

Nov. 2017

SJTU Joint Institute Dean's List

Summer 2017, Fall 2016

First Prize of SJTU Joint Institute Social Practice

Feb. 2017

COMPUTER SKILLS

Languages: C/C++, Python, Golang, JAVA, SQL, SystemVerilog, OCaml, Bash Script

Tools: Android Studio, Docker, LLVM, \LaTeX