

# Zhe (Lawrence) YE

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## EDUCATION

**ShanghaiTech University, School of Information Science and Technology**

*Bachelor of Engineering Candidate, Computer Science and Technology*

GPA: 3.74/4.0 (Top 6%, 13/252) overall, 3.93/4.0 in major

Shanghai, China

2018 - Expected 2022

**University of California, Berkeley, EECS Department**

*Undergraduate Extension Student, GLOBE Program, Computer Science*

Berkeley, CA

Aug., 2021 - Expected May, 2022

## HONORS AND AWARDS

**Undergraduate Scholarship (Top 2%) in ShanghaiTech University**

Dec., 2020

**Merit Student of ShanghaiTech University**

Dec., 2020

**Undergraduate Scholarship (Top 7%-15%) in ShanghaiTech University**

Dec., 2019

## RESEARCH INTEREST

Formal Verification, Programming Language Theory, Computer Security, Blockchain

## WORK AND RESEARCH EXPERIENCE

**University of California, Berkeley & Imperial College London**

Berkeley, CA

*Undergraduate Researcher* PI: Prof. Dawn Song and Prof. Arthur Gervais

Sept. 14, 2021 – Present

- Researching on blockchain bridges characteristics and measurements.
- Researching Miner Extractable Value investigation on multiple blockchains and bridges.
- Implemented data extraction and decode tools for smart contract instrumentation on Ethereum-like VM.
- Implemented a comprehensive blockchain simulator with cross-chain communication, private network like flashbots, different participants like miner and searcher to study blockchain incentive mechanism vulnerability.
- Conducting reinforcement learning on above simulator to extract optimal strategies for different participants to undermine blockchain incentive mechanisms.

**System & Software Security Lab (S<sup>3</sup>L) of ShanghaiTech University**

Shanghai, China

*Undergraduate Researcher* PI: Prof. Fu Song

July, 2019 – Present

- Researching on formal verification methods of the Diem Blockchain (previously named Libra) by Facebook.
- Developed *Movable*, an extensible symbolic execution framework for Move language using Rust.
- Feature includes high-coverage automatic test cases generation, common smart contract bug detection (e.g. integer overflow, time/transaction order dependency) and Hoare Logic based formal verification.
- Proposed a new algorithm for strengthening user-defined specification when verification fails, which can be applied to any formal verification based on Hoare Logic.
- Intensive paper reading and open source code reading. Complicated implementation, involving ~45k lines of code addition and ~30k lines of code deletion in Rust.

**DEEMOS Tech and MARS Lab of ShanghaiTech University**

Shanghai, China

*Full Stack Engineer*

Oct., 2020 – Jan., 2021

- Developed a realtime data transporting framework and an Unreal plugin using Aeron.
- Developed and deployed a deep learning face VFX web application using Vue.js.
- Worked on an Instagram-like photo sharing website project using Vue.js and Strapi.js.
- Worked on an AR VFX application project using Unity and Apple ARKit.

## PROJECT WORK

**Volvis: Real-time Volume Renderer** *CS271 Computer Graphics II*

Spring 2021

- Implemented a real-time volume renderer based on WebGL.
- Implemented volume shadowing feature.
- Implemented a Transfer Function editor based on bazier curve.

**ATNet** *CS120 Computer Network*

Fall 2020

- Developed a computer network using sound cards and acoustic signals from scratch.

- Implemented from physical layer to transport layer, providing a reliable data link and supporting ICMP pinging, basic NAT and FTP.

#### **A Classroom Offline Renderer** *CS171 Computer Graphics I*

Spring 2020

- Implemented a global illumination renderer using path tracing.
- Implemented loop subdivision algorithm.
- Implemented a volume renderer using ray casting.

#### **Planet Stranding, A Unity Game Demo** *ARTS1303 Unity Game Development*

Fall 2019

- Created a game demo combined Death Stranding and No Man's Sky.
- Used advanced feature of Unity, like IK, animation layer, shaders.

#### **VChain: A Blockchain and Telematics Based Driver Assistance Decision and Insurance Assessment System**

*The Best Award of BitRun 9102 Hackathon, Hangzhou*

April, 2019

The value of VChain comes from the application of driver-assisted decision making and the innovation of the business model, the former relying on blockchain security and computation without latency, and the latter as a result of data aggregation and movement.

- In one scope, multiple car sensors and their data transactions are trusted by the blockchain created by CPChain.
- Artificial intelligence decision making, based on IoT big data. Heterogeneous data interoperability, resulting in big data aggregation.
- Interaction and application of data assets, data assets are leveraging the verifiable characteristics of the main chain to benefit emerging business models such as insurance valuation.

#### **Hexo-theme-next** *Open Source Project*

2018 – 2019

*Core Maintainer*

Hexo-theme-next is the most popular theme of Hexo, a static site generator. It has around 24k stars in total.

- Issue and Pull Request reviewing, refactoring codes from v6.0 to v7.0.
- Developed a social content sharing plugin.
- Fixed a security bug in its visitor counting system which could lead to unauthorized modification of website contents.

#### **TEACHING EXPERIENCE**

**CS110 Computer Architecture I** *Teaching Assistant*

March, 2021 – June, 2021

**ARTS1303 Unity Game Development** *Teaching Assistant*

July, 2020 – Aug., 2020

**SI100B Introduction to Information Science and Technology** *Teaching Assistant*

March, 2020 – June, 2020

#### **MISCELLANEOUS**

**Language:** Chinese(Native), English(Fluent); CET-6, TOEFL: 105