YINING SHE

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EDUCATIONAL BACKGROUND

Carnegie Mellon University *Pittsburgh, United States*
Ph.D. in Software Engineering, Advised by Eunsuk Kang *Aug.2022-Present*
Software and Societal Systems Department, School of Computer Science

ShanghaiTech University *Shanghai, China*
Bachelor of Engineering in Computer Science and Technology *Sep.2018-Jun.2022*
GPA: **3.83/4.0** | Rank: **4/252**

RESEARCH INTEREST

Software Engineering, Artificial Intelligence, Cyber-Physical Systems, Formal Methods

RESEARCH EXPERIENCE

Software Design and Analysis Lab | Advised by Eunsuk Kang | Carnegie Mellon University *2022-Present*

- **Modeling and Analyzing Long-term Fairness in Adaptive ML Systems** *(Ongoing)*
  Focus on modeling long-term fairness issues raised by AI-based socio-technical softwares such as loan approval or predictive policing systems.
  - Decisions made by seemly-fair software can impact the environment in the long term by creating feedback loops, which create bias for protected groups (race, gender, age).

  Goals:
  - Propose formal model of long-term fairness;
  - Evaluate feedback loop in real-world AI based software systems;
  - Design interventions to ensure fairness adaptation.

Human-Cyber-Physical-System Lab | Advised by Zhihao Jiang | ShanghaiTech University *2021-Present*

- **Cognitive Digital Twin for Driving Assistance**
  Proposed a cognitive digital twin framework that models and learns the driver's decision process.
  - Analyzed how a driver updates his perception during driving a car;
  - Proposed a method to calculate driver's utilities and predict their strategies;
  - Validate the model and design corresponding experiments;
  - Use Unity to create a virtual driving environment to simulate arbitrary driving scenery for running the digital twin system.

- **Model-checking-based Diagnosis Assistance for Cardiac Ablation**
  Proposed a model-checking-based diagnosis assistance system to improve accuracy and efficiency of diagnosis in cardiac ablation.
  - Introduced a kind of heart model to represent heart conditions and implemented it using UPPAAL;
  - Introduced a model-checking-based method to enumerate ambiguity using heart model refinements;
  - Proved the soundness and completeness of the method;
  - Designed and implemented clinical case experiments for analysis.

- **Driving Simulator for Autonomous Vehicle Platoon**
  Developed a first-person driving simulator for research of Stable Interaction of Autonomous Vehicle Platoons with Human-Driven Vehicles.
  - Implemented a driving simulator to collect data of human driver in Unity;
  - Designed and held experiments for identifying the human behavior model.

Virtual Reality and Visual Computing Center | Advised by Jingyi Yu | ShanghaiTech University *2019-2021*

- **High-Resolution Neural Face Swapping for Visual Effects**
  Studied on the ML model that swaps the appearance of a target actor and a source actor while maintaining the target actor's performance.
  - Improved and refined the method introduced in the paper "High-Resolution Neural Face Swapping for Visual Effects";

  - Designed and captured the data set for face swapping to prove the robustness;
  - Improved the efficiency by taking advantage of multi GPUs.

- **Portrait Shadow Manipulation**
  Trained a DNN to Remove foreign shadows and soften facial shadow in a portrait photo.
  - Implement a Neural Network to removed the foreign shadow on human face in a portrait image based on the paper "Portrait Shadow Manipulation";
  - Generated training data using GAN-generated portrait images and a foreign shadow synthesis algorithm.

- **The Image-Based Relighting**
  Implemented a method to generate images of object under arbitrary illumination using the One-Light-at-A-Time, OLAT dataset captured by a light stage.
  - Implement the paper "Acquiring the Reflectance Field of a Human Face" and putted it into the use of the newly built light stage in the lab.

PUBLICATIONS

- Mohammad Piran, **Yining She**, Renzhi Tang, Zhihao Jiang, Yash Vardhan Pant. **"Stable Interaction of Autonomous Vehicle Platoons with Human-Driven Vehicles"**, *In American Control Conference (ACC) 2022.*

HONORS & AWARDS

Outstanding Graduate of Shanghai | Shanghai	*2022*
Outstanding Graduate | ShanghaiTech University	*2022*
Outstanding Teaching Assistant | ShanghaiTech University	*2021*
Merit Student | ShanghaiTech University	*2019*
Outstanding Student in Social Practice | ShanghaiTech University	*2019*
Second-Prize of Undergraduate Special Scholarship | ShanghaiTech University	*2019*
Second-Prize of Undergraduate Special Scholarship | ShanghaiTech University	*2018*

COURSEWORK EXPERIENCE

Compiler for the Classroom Object-Oriented Language | Course of Compilers
- Completed all components of a compiler, covering lexical analysis, parsing, semantic analysis, and code generation.

Pintos | Course of Operating System
- Strengthened several core functions of a simple operating system framework, including kernel threads, loading and running user programs, and a file system.

Single Image Portrait Relighting | Course of Computer Vision
- Took in a single-view portrait and generated a relighted portrait under target environment using deep NN.

Linear Programming Solver | Course of Numerical Optimization
- Used python to implement a linear programming solver through the two-phase method of the simplex algorithm.

Chrome Dinosaur Game in RISC-V | Course of Computer Architecture I
- Use RISC-V to implement the Chrome Dinosaur Game on Sipeed Longan Nano development board.

Intelligent Player | Course of Artificial Intelligence
- Implemented Q-Learning and Deep Q-Network to play a pixel game called BB-TAN.

EXTRACURRICULAR ACTIVITIES

Teaching Assistant | ShanghaiTech University

- Course of Algorithms and Data Structure *Sep.2021-Present*
- Course of Software Engineering *Feb.2021-Jun.2021*
- Course of Algorithms and Data Structure *Sep.2020-Jan.2021*

PROFESSIONAL SKILLS

Programming Languages	C/C++, C#, Python, MATLAB, RISC-V
Tools and Frameworks	Alloy, UPPAAL, LTSA, PyTorch, OpenCV, Unity, Unreal, Git