Rui XU

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EDUCATION

University of Southern California
Master of Science in Computer Science (Multimedia and Creative Technologies) 05/2025

- Multimedia Systems Design, 3-D Graphics and Rendering.

City University of Hong Kong
Bachelor of Science in Computer Science 10/2023

- Computer Graphics, Artificial Intelligence, Computer Vision for Interactivity, Design and Analysis of Algorithms, Machine Learning, Database, etc.
- GPA: 3.81/4.3 (3.76/4.0, First Class Honour), top 7%/145 people
- Dean's List, College of Engineering, Sem A & B 2020/21 and Sem A & B 2021/22

University of California, Los Angeles
Summer Session 08/2023

- Ordinary Differential Equation (A), Music Industry Engineering.

Peking University
Summer School 07/2022

- Control Theory (A).

SKILLS

- Languages:
  - English: Fluent; Chinese (Mandarin): Native; Chinese (Cantonese): Conversational
- Programming Languages & Operating Systems:
  - C/C++, Python, Java, C#, Javascript, CSS, HTML, Linux Ubuntu Commands, etc.
- Operating Systems & Tools:
  - Linux Ubuntu, Android Studio, MobaXterm, WinSCP, Navicat, Android Emulators, etc.
- Programming IDEs & Tools:
  - Visual Studio, Visual Studio Code, PyCharm, Anaconda, IntelliJ IDEA, Git, Fork
- External Libraries, Packages & Frameworks:
  - Vue, Node.js, Flask, SQLAlchemy, Jekyll, Axios, PyTorch, NumPy, OpenGL, Open3D, OpenFrameworks, OpenCV, Matplotlib, Typescript
- Documentation:
  - LaTeX, Markdown, Microsoft Office, OBS Studio, Photoshop, Premiere Pro, After Effects, Vegas Pro
- Graphics & Human-Computer Interaction:
  - Meshlab, Unity Engine, Unity Asset Store Tools, HTC Vive, Oculus, VRChat, 3ds Max, Blender, VRoid Studio, NeuronMocap

INTERESTS

- Research Interests: Computer Graphic (3D reconstruction, digital human, physical simulation) Computer Vision (motion capture, object detection), Deep Learning
- Daily Hobbies: Natural-Language-Processing Applications (ASR, VITS), Music & Video Making, Anime, Graphics Games, History & Geography, Cycling

PROJECTS

Poo Poo Bird
Global Game Jam 2021 Hong Kong 01/2021

- A computer/mobile game developed with controllers, sounds, colliders and interactions.

RESEARCH EXPERIENCE

Research on Point Cloud Registration
Participant 04/2023~06/2023

- Experimented on some well-performed point cloud descriptor generation frameworks, including PPF-FoldNet, Perfect Match, FCGF, D3Feat, SpinNet.
- Attempted to build and visualize a dataset by sampling from 3DMatch intermediate file and conduct ICP fine local registration using Open3D toolbox.

City University of Hong Kong, Department of Computer Science
Final Year Project (FYP)
Participant 09/2022~04/2023

- Applied several 3D reconstruction and novel rendering models to establish a pipeline of converting input image set into textured 3D mesh, including but not limited to NeRF and its variants, MVSNet, Occupancy Network.
- Utilized virtual machine, WSL, X-server, and Windows/Ubuntu dual system to promote the project.
- Adopted, analyzed, and strengthened the method of NeuS incorporating NeRF volume rendering and SDF representation to achieve automatic vertex texture giving on the mesh.

HCI·X Summer Research Program 2022
Participant 06/2022~11/2022

- Reorganized the project of speech bubble sketch generation with dictated texts via webpage using Vue+Typescript framework, and developed Active Contour and computer vision algorithms to realize the detection of strokes.
- Designed and built an immersive learning scene for teaching activities in public administrative courses using Unity incorporated with VRChat SDK.

City University of Hong Kong Shenzhen Research Institute (CityU SRI)
Architecture and Civil Engineering Research Center
Research Assistant (Intern) 06/2021~06/2022

- Built the integrated system of Building Information Modeling (BIM) Dashboard and Student Platform based on Seafile cloud server used for teaching activities, involving the technical details of Flask web application framework, PySQL, Linux Ubuntu server management, X-server off-screen rendering pipeline, etc.
- Conducted scene simulation and data analysis by utilizing Unity engine and VR experiments in the research project of influence of crowd flow on evacuation way-finding.
- Established a prototype Unity VR-based simulated training scene of on-site construction cranes designed for construction site workers for later research, including the technical merits of physical engine simulation (wind, rope, collision), external hardware devices (VR, handles, joysticks), host connections and synchronization across WAN through remote server, 3D modeling by 3ds Max, etc.

City University of Hong Kong, Department of Computer Science
Research Mentoring Scheme (RMS)
Participant 06/2020~06/2021

- Reproduced the experiments based on related research topic about SenseHAR, a robust virtual activity sensor for smartphones and wearables.
- Calibrated the datasets of human eyelids and irises for later training and testing of the iris tracking model.
- Assisted on the standardization process of experiment data, similarity check of time series, and data augmentation of Mel-spectrum using GAN-based methods.

WORK EXPERIENCE

City University of Hong Kong, Chinese Students and Scholars Association of City University of Hong Kong Undergraduate (CSSAUG)
Technician of Forum Website 02/2020~09/2020

- Assessed potential aspects of improvements of the original official accounts.
- Developed a WeChat mini program using Wechat developer tools, utilizing WeiXin Markup Language (WXML), cloud database and cloud functions.
- Designed the user interface and functions of Forum Website, and deployed the website on the server.
- Regularly oversaw maintenance and management works.

PUBLICATIONS

- Zhang, M., Xu, R., Siu, M. F. F., & Luo, X. (2023). Human decision change in crowd evacuation: A virtual reality-based study. In *Journal of Building Engineering* (p. 106041). Elsevier BV. https://doi.org/10.1016/j.jobe.2023.106041 (IF: 7.144, 9/138 in ENGINEERING, CIVIL)
- Zhang, M., Xu, R., Wu, H., Pan, J., & Luo, X. (2023). Human–robot collaboration for on-site construction. *Automation in Construction*, *150*, 104812. https://doi.org/10.1016/j.autcon.2023.104812 (IF: 10.517, 1/138 in ENGINEERING, CIVIL)

HONORS & AWARDS

Talented Development Scholarship, the Hong Kong Special Administrative Region Government Scholarship 07/2023
The 1st Runner-up of Fintech Track, **CityHack2023, City University of Hong Kong** 02/2023
The Hong Kong, China – Asia-Pacific Economic Cooperation Scholarship 06/2022
Talented Development Scholarship, the Hong Kong Special Administrative Region Government Scholarship 06/2022
Golden Glasses Award for Best Engineering, **2022 Summer Bootcamp of Future Interaction for Smart Glasses, National University of Singapore** 05/2022
The 1st Runner-up of AI Track, **CityHack2022, City University of Hong Kong** 02/2022
Excellent Thinking Award, **GBA Public Administration Data Analytics Contest, Sun Yat-Sen University** 01/2022
Award Winning Certificate, **PwC's HackaDay 2021 Capture the Flag Competition, HKPC** 12/2021
Certificate of Merit, **Hong Kong Cyber Security New Generation Capture the Flag Challenge, PwC** 12/2021
Certificate of Honorable Mention, **CITYF Capture the Flag Cybersecurity Competition 2021, City University of Hong Kong** 10/2021
Bronze Award, **Macau, Asia Regional, International Collegiate Programming Contest (ICPC)** 05/2021
Silver Award, **Jinan, Asia Regional, International Collegiate Programming Contest (ICPC)** 12/2020
Silver Award, **Changchun, China Collegiate Programming Contest (CCPC)** 11/2020