Siheng Zhang

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Education

University of Southern California, MS in Computer Science   Sep 2023 – May 2025
- **GPA: 3.50**/4.0
- **Selected Courses:** *3-D Graphics and Rendering, Geometric Shape Modeling, Game Engine Development, Computer Animation and Simulation, etc.*

South China University of Technology, BE in Software Engineering   Sep 2019 – Jun 2023
- **GPA: 3.89**/4.0   **Rank: 4**/275
- **GRE: 327**   (**Verbal:** 157, **Quantitative:** 170)

Technologies

Languages: C/C++, Python, Java, JavaScript, HTML/CSS
Libraries: Eigen, libigl, Mitsuba3, Pandas, OpenCV, scikit-learn
Frameworks: PyTorch, Flask, Node.js, Bootstrap, Angular
Databases and Cloud Services: MongoDB, PostgresSQL, AWS
Tools and Software: Git, Perforce, Anaconda, LaTeX, Roboflow, Autodesk Maya

Experience

Internship, Center for Theory and Methods of Software Construction – China   Sep 2022 – Dec 2022
- Contributed to the development of Dacheng Cloud, an online course management app
- Used Spring Boot on Alibaba Cloud for back-end and Angular for front-end

Research Assistant, College of Software Engineering, SCUT – Guangzhou, China   May 2022 – Aug 2022
- *Advisor: Pingjian Zhang*
- Worked on computer vision and its applications on COVID-19 diagnosis and vehicle drivers' motion detection
- Applied ResNet, YOLO and other CNNs on object detection and semantic segmentation, used Class Activation Mapping(CAM) and Model Ensembling to reduce cost over 10% and enhance performance
- Annotated over 5000 images with Roboflow and used Pandas to manipulate and analysis large scale data

Projects

A Discrete Differential Geometry Processing Library in C++   github.com/SihengZhang/DDG
- Developed a full pipeline geometry processing library in C++, using Eigen as numerical solver
- Implemented mesh reconstruction, registration, smoothing, subdivision, decimation, deformation, etc.

Intrinsic Triangulations Processing   github.com/SihengZhang/ITP
- Implemented this library based on SIGGRAPH paper Sharp and Crane [2019]
- Solved intrinsic-extrinsic mesh conversion, geodesic, surface network shortening, Delaunay triangulation construction, etc.
- Supplemented intrinsic edges processing and visualization functions in libigl

A Photon Mapping Ray Tracing Renderer
- Used photon mapping to generate global illumination
- Applied Monte Carlo algorithm to cast rays
- Constructed AABB tree and Paralleled for efficiency

Prime Engine Development
- Expanded PrimeEngine, a C++ based 3D game engine originally developed by Artem Kovalovs

- Used Autodesk Maya to design scenes and animations and import assets into engine by Lua scripts
- Implemented animation, physics and rendering systems of prime engine

Using CAM to Diagnose COVID-19 by Chest X-rays
- Used CAM (Class Activation Mapping) as a weakly supervised object detection on COVID-19 Chest X-rays
- Applied CAM on traditional classification neural network (ResNet and DenseNet) to localize the infection
- Automatically generated heat map of infection on X-rays and shown the detection boxes

A Drivers' Motion Detection System Based on Semantic Segmentation
- Assembled a pre-trained YOLOv8 model and an YOLOv5 model for accurately detection
- Achieved over 98.1% precision for real time processing at a 60-fps refreshing rate

Full stack design of a stock searching web & IOS application
- Used Python, node.js for server-side design and JavaScript, Angular, Swift for client-side design
- Used MongoDB as database and AWS to serve RESTful API
- This application can return real-time stock information and historical data, rendering by dynamic charts

Additional Honors and Awards

Intellect Foundation Award   2021
- New function to openGauss database to record and show the latest SQL instruction from each user
- Funded by Huawei Technologies Co Ltd

First Prize Scholarship   2020
- Awarded 5000CNY by South China University of Technology (**top 5%**)