Ruyu Yan

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EDUCATION

Cornell University, College of Engineering Ithaca, New York
Computer Science | **GPA: 3.97** | Dean's List Expected May 2023 (continuing to graduate school)
Relevant Coursework: OOP and Data Structures, Functional Programming, Analysis of Algorithm, Computer Vision, Intro to Machine Learning, Computer System Organization, Interactive Computer Graphics, Computation Content Creation

WORK EXPERIENCE

Full-time Research Assistant at Abe Davis's Lab Aug 2022 - Present
Cornell University Ithaca, New York

- Lead the project of *Color Contrastive Tone Mapping*, which aims to build an image/video processing system for performing edge-aware color tone mapping with a user-controlled notion of color contrast.
  - Researched color temperature approximation algorithm and how it relates to perceptual brightness, and employed it on extending the perceived dynamic range of HDR images.
  - Designed web interface for controlling non-linear adjustment on the color contrast with real-time visualization.
  - Developed multi-pass pipeline for efficient image and video processing using WebGL, OpenGL, and Halide.
- Support several projects relevant to digital agriculture and image synthesis.

Summer Research Fellow at Summer Geometry Initiative Jul - Aug 2022
Massachusetts Institute of Technology Remote

- *Making Deep Implicit Fields Local*: Studied recent literature on implicit neural representations of 3D geometry, and experimented with different auto-decoder-based architectures to extend the expressiveness of local details for large scenes.
- *Scene Mixing for 3D Point Clouds*: Developed various algorithms on dividing and re-assembling point clouds to generate new scenes with novel out-of-context environments.
- *SE(3) Invariant and Equivariant Neural Network for Geometry Processing:* Implemented SE(3) invariant point cloud classifier with PyTorch by augmenting the vanilla PointNet architecture with frame averaging operator.

Course Staff at Department of Computer Science Aug 2020 - May 2022
Cornell University Ithaca, New York

- Hold weekly office hours, answer questions on online discussion platform, and grade homework and exams.
- *Functional Programming and Data Structure:* Advised student teams on their final projects of OCaml programming. Provided suggestions on collaborative programming practice, coding style, and interface design.
- *Computer Vision*: Posed homework questions on image processing and supervised homework grading.

RELEVANT PROJECTS

ReCapture: AR-Guided Time-lapse Photography Jul 2021 - Present
First Author

- Researched an Augmented-Reality-based image sampling system for time-varying appearances, which helps the user create cool time-lapse video with sparse-sampled images using their mobile phone.
- Independently developed an iOS APP that provides intuitive guidance for how to pose the camera. Applied graphics techniques such as homography and reprojection for visualizing the varying appearances of a scene across time and space.
- Created a web interface using React and D3.js for visualizing image sample distribution and preview time-lapse videos.
- Full paper accepted at The ACM Symposium on User Interface Software and Technology (UIST) 2022.

Real-time 3D Renderer for Chinese Ink Painting Apr - May 2022
Graduate Course Project

- Built a rasterization pipeline for rendering 3D scenes in the style of Chinese ink painting with interactive camera control.
- Created a novel brush stroke detection and painting algorithm for adaptively drawing the silhouette and interior of objects, which realistically simulates the effects of ink diffusion and varying stroke width.

Cornell Cup Robotics Feb - Dec 2020
Member of Minibot ECE

- Worked on the prototype of a programmable robot Minibot dedicated to youth programming and robotics education.
- Implemented remote control feature with Xbox Controller and positioning feature with IMU and rotary encoder. Designed path planning algorithms based on ultrasonic sensor and vision system, and developed a 2D graphics-based software simulator for testing.

SPECIALIZED SKILLS

Programming Languages: Python, Swift, C++, TypeScript, OCaml, Java, MATLAB, GLSL, Bash
Engineering Skills: 3D graphics programming, iOS development, Data analysis and visualization