Helen Huang

https://helen-huang9.github.io | github.com/helen-huang9 | helen_huang@brown.edu | (781)-571-8068

EDUCATION

Brown University, *Sc.B in Computer Science*, 3.92/4.00 GPA   Providence, RI | **Expected Graduation May 2024**
Relevant Courses: Deep Learning, Machine Learning, Computer Vision, Advanced Computer Graphics, Computer Animation, Operating Systems, User Interface and Experience, Linear Algebra, Discrete Structures and Probability, Computer Networks, Computational Linguistics, Computational Photography
Current Courses: Distributed Systems

TECHNICAL SKILLS

Languages: C, C++, Python, Swift, Go, Java, Javascript, HTML/CSS, SQL
Frameworks/APIs: PyTorch, Tensorflow, React, Next.js, MongoDB, OpenGL, Pandas, scikit-learn, ChatGPT API, Maya, MatLab

EXPERIENCE

Computer Graphics TA, *Brown University*   **June 2022 - Jan 2022***, June 2023 - Jan 2023**
- Helped write the projects and labs for Brown's Computer Graphics course during the summer
- Holding weekly office hours and grading student assignments during the fall

Project Manager Intern, *Cocobolo Group*   **June 2023 – August 2023**
- Led a team of 6 in designing, developing, and QA testing an iOS app and website for servers and customers at restaurants
- Held daily standups with engineers to discuss high-level software decisions in Swift and prioritized tasks using Jira
- Helped hire a QA tester and web developer to improve app stability and website development efficiency

Research Assistant, *Brown University Interactive 3D Vision & Learning Lab*   **June 2022 – December 2023**
- Won a summer research grant to research neural radiance fields for photorealistic novel view synthesis under Prof. Sridhar
- Tested scene data from our synthetic capture stage on various NeRF models to ensure quality of data for long scene modeling and hand-object interaction. Results can be found at https://helen-huang9.github.io/projects/

PROJECTS

Most of the following projects' results can be found on my project page: https://helen-huang9.github.io/projects/

ChatAI Website, *Personal Project*   **June 2023 - Present**
- Designed and implemented a full-stack website that allows users to chat with AI-generated celebrities and famous characters (https://chat-ai-helen-huang9.vercel.app)
- Implemented the front-end of the website in Javascript using React, Next.js 13, and Tailwind CSS
- Implemented the back-end of the website using ChatGPT's Chat Completions API and MongoDB to dynamically generate realistic chat responses and store celebrity profiles

Reddit Depression Detector, *Computational Linguistics Course*   **November 2023 - November 2023**
- Implemented the paper, *Detecting Symptoms of Depression on Reddit*, which uses RoBERTa and LDA embeddings from Reddit posts to detect and predict specific depression-related symptoms in contrast to control posts by the same Reddit users
- Used Pandas for dataset preprocessing, LdaMulticore to generate topic embeddings for each post, RobertaModel to generate post embeddings for each post, and RandomForestClassifier to classify whether a post is depression-related or not
- Achieved mean UAC scores within 2% of expected results using 5-fold cross-validation

IP / TCP Network Stack, *Computer Networks Course*   **October 2023 - November 2023**
- Implemented a virtual IP stack in Go that implements the link layer, IP forwarding, and routing using the RIP protocol.
- Implemented a virtual TCP stack in Go that is RFC9293-compliant which implements the TCP state machine, sliding window protocol, retransmissions, and connection termination

Music Streaming Service, *Computer Networks Course*   **September 2023 - September 2023**
- Designed and implemented a server and client music streaming application using TCP connections for client-server communication and UDP connections for streaming music from the server to the client in Go

Physics-based Simulator and Renderer, *Computer Graphics course*   **January 2023 – May 2023**
- Implemented a pathtracer that supports diffuse, glossy, mirror, and refractive BRDF materials with anti-aliasing techniques like stratified sampling and importance sampling in C++
- Implemented the paper, *Real-time Ink Simulation Using a Grid-Particle Method,* which is a physics-based ink-in-water simulation to render realistic videos of ink drops diffusing in water using C++. Later optimized performance to be in real-time by reimplementing it in Swift and Metal

POSIX-like Threading Package, *Operating Systems course*   **January 2023 - May 2023**
- Implemented a POSIX-like user-level threading package that is multiprocessor-safe and supports thread creation, deletion, joining, mutexes, condition variables, and priority-based scheduling in C

Color Rebellion 3D Animation, *Computer Animation course*   **October 2022 - December 2022**
- Created a 5-minute 3D animation with a group of four about a fox fighting enemies to restore color to a colorless world
- Helped model, texture, rig, and animate each character, set, and scene using Maya

Signature Forgery Detector, *Deep Learning course*   **September 2022 - December 2022**
- Tested the performance of a CNN, Vision Transformer, Siamese CNN, and Siamese Vision Transformer using LIME to analyze and interpret how each model learned to classify real and forged signatures in Python and PyTorch
- Used this research to develop our final signature forgery detector with 86% precision and 93% recall using a Siamese CNN

Cat Ninja iOS Game, *Personal Project*   **June 2022 - August 2022**
- Designed and developed an iOS app that allows the user to play as a cat and swipe toys and avoid water balloons. Implemented in Swift using the SwiftUI and SpriteKit frameworks. Soon to be available on the App Store

Computer Systems Projects, *Computer Systems course*   **April 2022 – May 2022**
- Implemented a Venmo-like banking service in C++ where users may withdraw, deposit, and check their balance as well as pay and charge other clients. Used synchronized data structures and multithreading to ensure fast and secure transactions
- Implemented a FaceBook-like distributed system in C++ to handle server and client connections using RPCs and sharding

3D Reconstruction from Images, *Computer Vision course*   **April 2022 – May 2022**
- Produced a 3D voxel model of my Computer Vision professor in Python for my final project using photogrammetry techniques on self-captured images and camera poses

Iron Man Helmet, *Design Engineering course*   **March 2021 – April 2021**
- Led a group of 4 people to design and create a voice-activated Iron Man helmet using a Raspberry Pi for our final project
- Researched, designed, and engineered the mechanism that opens and closes the mask using servos, prototyping materials like cardboard, and laser cutters

LEADERSHIP AND CLUB EXPERIENCE

Asian Student Alliance (ASA), *Head*   **St. Mark's School | September 2018 – May 2020**
- Led the 100+ student Asian affinity group in weekly meetings, school-wide events, and festivals

St. Mark's Varsity Girls Ice Hockey, *Player*   **St. Mark's School | September 2016 – May 2020**
- Won the Frey Prize for best contribution to the team for sportsmanship and teamwork