Helena Yang

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Education

School of Computer Science, Carnegie Mellon University
Bachelor of Science - BS
Computer Science, May 2024
Cumulative QPA: 3.91/4
Dean's List, High Honors

Relevant Coursework:

- 15-213 Introduction to Computer Systems (C)*
- 15-210 Parallel & Sequential Data Structures & Algorithms (SML)*
- 15-150 Principles of Functional Programming (SML)
- 15-122 Principles of Imperative Computation (C)
- 15-151 Mathematical Foundations of CS
- 36-218 Probability Theory for Computer Scientists*
- 21-268 Multidimensional Calculus
- 21-241 Matrices & Linear Transformations
- 60-220 Technical Character Animation (Maya/Arnold)*

*Fall 2021

Skills

Languages:
Python · C · C++ · SML · Typescript/Javascript · Julia

Tools:
MATLAB · Unity · Unreal Engine

Activities

Penrose Research Group
Artist Alley Club
Women @ SCS
Rewriting the Code

Work Experience

CMU Institute for Software Research · Penrose Research Intern   Jun 2021 - Present

- Investigating automatic construction of unusual diagram configurations via singular value gradient descent optimization & tangent space exploration of constraint Jacobian matrices.
- Reconfigured Penrose's Style language parser, compiler, & automator to support automated generation of staged diagrams using Nearley.js & Typescript.
- Implemented colorblind deficiency-friendly palette assignment tools in ReactJS and NodeJS.

15-112 Fundamentals of Programming & CS · Teaching Assistant   Jan 2021 - Present

- Develop and teach weekly recitations for 30+ students, teach data structures & algorithms review sessions for large groups, provide 1-1 tutoring, hold solo office hours, grade homework/exams.
- Mentored 8 students through 3-week long, 1000+ line term projects.
- Organized and led mini-lecture on 3D graphics (projection, perspective rendering, shading).

MIT Summer Geometry Institute Tutorial Week   Jul 2021

- Implemented geometry processing techniques and algorithms (triangle mesh data structures, loop subdivision, linear blend skinning, shape representations, laplacian eigendecomposition, heat kernel signatures, directional fields) using MATLAB & gptoolbox.

Google Computer Science Summer Institute   Jun 2020 - Jul 2020

- Programmed 10+ mini apps using p5.js, sockets, & web APIs in Google engineer-led cohorts.

National Institute of Standards & Technology · Programming Intern   Jun 2019 - Aug 2019

- Co-developed program that automated transition of 100+ scripts from Python 2 to 3.
- Improved performance of a.b. initio computational chemistry scripts using NumPy & SciPy.

Projects

2.5D Room Planner & Perspective Viewer · Fundamentals of Programming & CS, Dec 2020

- Programmed a 2.5D graphics modeling app from scratch that allows users to customize, rotate, and view furniture objects from isometric and first-person perspectives in Python.
- Leveraged projection matrices and perspective rendering matrix theory.
- Selected among 10 term projects out of ~500 to present during course lecture.

Automated Study Schedule Builder · HackMIT, Sep 2020

- Developed and integrated a Python algorithm that computes a personalized study block schedule using user data (calendar events, tasks) with Flask, SQL, and Google Calendar API.

Electric Truck Math Modeling Paper · MathWorks Math Modeling Challenge, Mar 2020

- Developed math model to compute the number and distribution of electric truck chargers needed along five US freight corridors given current levels of long haul traffic, conducted model sensitivity analysis, collaborated on technical writeup with four other teammates.
- Awarded scholarship distinction among 37 top papers out of 760 submissions (top 4.8% of submissions nationally) by The Society for Industrial & Applied Mathematics.

Honors

- *Facebook Above and Beyond Computer Science Program*, Fall 2021
- *4X Science Olympiad Regionals Event Finalist*, 2020, 2019