Curriculum Vitae
Shiva Peri

As a recent graduate in computer science and art, I possess a unique skill set that combines technical expertise with creativity and design. I have a passion for exploring the intersection between art and technology, including machine learning, digital manufacturing, and robotics. My strengths lie in my ability to think critically, approach problems with a creative mindset, and work collaboratively with diverse teams.

Education

BCSA, Computer Science and Art
Carnegie Mellon University (2019-2022) with University Honors

- Pursued an integrated double-major combining studies in computer graphics algorithms, graph algorithms, systems development, software engineering, robotics, visual arts, and new media

- Computer Vision · Deep Learning · 3D Modeling · CAD · Creative Coding · Functional Programming · Fullstack Development · Systems Programming · Physical Prototyping · Parametric Design · Game Design

- C · C++ · Unity C# · Python · JavaScript · Typescript · Rust · Java

Employment

Autodesk Research, *Robotics Engineering Intern* (May-Aug 2022)

Integrated Foxglove Studio into C++ adaptive robotics framework for live data visualization. Utilized Google Protobuf serialization to forward ROS pub/sub messages to web server and local log file. Implemented behavior tree editor using REST API to control robotic systems.

Apple, *Siri Conversational Interaction Prototyping Intern* (Jun-Aug 2021)

Collaborated on a tool for designers to document their designs and preview them on multiple platforms. Helped reconcile various pattern schema from design and engineering. Developed design tool in Unity to explore the use of audio spatialization on iOS.

CMU Metabologenomics Lab, *Web Developer* (Jan-Apr 2022)

Developed Svelte Storybook components to visualize spectrometry, molecular, and genomic data

Human Computer Interaction Institute (HCII), *Research Assistant* (Feb-Sept 2020)

- From Tactile to NavTile: Opportunities and Challenges with Multi-Modal Feedback for Guiding Surfaces during Non-Visual Navigation
Responsible for designing, prototyping, and manufacturing interactive street tiles for the visually impaired. Research PIs: Patrick Carrington, Saiganesh Swaminathan.

- 3D Printing Shape-Changing Interfaces with Magnetorheological Fluid
Developed models for 3D printing fluidic hardware to use magnetorheological fluid in haptic and soft robotics applications. Presented at CMU's Meeting of the Minds 2020. Funded by SURF 2020 Grant. Research PIs: Scott Hudson.

Publications

1. *(in review)* 2023, Commercial Building Portfolio Energy Lean Analysis 1

2. *(in review)* 2023, Commercial Building Portfolio Energy Lean Analysis 2

3. *(in review)* 2023, US Building Decarbonization 1

4. *(in review)* 2023, US Building Decarbonization 2

Acknowledgements

1. 2020, From Tactile to NavTile: Opportunities and Challenges with Multi-Modal Feedback for Guiding Surfaces during Non-Visual Navigation (link)

Projects

- 2022, (on-going) Browser-Based CAD software
  BXA Capstone Project

  Created a fullstack browser-based CAD program using React, Three.js, and Firebase. This project is currently being refactored to use a Boundary representation backend. The current implementation allows users to make simple meshes using Constructive Solid Geometry (CSG) operations for 3D printing applications.

- 2022, RL Animated Human Actors Pipeline
  Rethinking Automation in Construction Project

  Developed pipeline to animate human actors from Blender and Unreal Engine to Nvidia Omniverse. Iterated pipeline to integrate with ROS and Omniverse ISAAC Sim for reinforcement learning applications

- 2022, Lipschitz Regularization Mesh Interpolation (repo)
  Learning-Based Image Synthesis Final Project

  Developed a deep neural network to learn the implicit neural representations of discrete meshes. Model utilized DeepSDF architecture and Lipschitz regularization to interpolate between latent representations

- 2021, Chairmaggedon, Plotter Artwork
  Drawing with Machines Final Project

  Developed a web-scraping pipeline to download 3D models of chairs. Manually cleaned dataset and created a physics simulation using Blender. Created a large scale plotter artwork of the final output using the Vpype Python library.

- 2021, Modular Kirigami Snakebot
  Foldable Robotics Final Project

  Devised and engineered robotic kirigami modules using custom composite materials. Lasercut custom-made composite material to ensure planar rotation of individual modules. Programmed servo motors using Arduino to produce continuous motion across consecutive modules

- 2021, Psilonaut, video game
  Experimental Game Studio Final Project

  Co-developed Unity open-world interactive experience in which players can explore, try, and breed different kinds of psychedelic mushrooms.

- 2020, Grasshopper Mesh Tiler Script
  Intermediate Rapid Prototyping Final Project

  Grasshopper script to tile one mesh onto another with user-defined parametric controls.

- 2020, Augmented Reality Floaties
Interactivity and Computation Final Project

  Augmented reality video project made using Blender, image tracking, video compositing, and 3D animation.

- 2020, Google ATAP Soli Sandbox Experiments
1. Tile World Builder, 2. 3D Construction Toy, 3. Breadcrumb Trails

  Interactive creative code experiments made for Google Advanced Technology and Projects using Google Pixel 4's Soli gestural sensor. Created three unique experiments each exploring a different human-computer interaction interface (ie. experimental CAD tools, file system ux)

- 2019, Fourier Drawing Machine
15-112 Term Project (*Voted Best TP of F19 Semester*)

  Python program in which users can make a custom drawing machine to create spirograph drawings. The machine can be customized in the following ways: wheel radius/speed, number of wheels, pen color/size, etc. The user can save and view drawings at various playback speeds. The user can also upload an svg file and watch the generated drawing machine draw the path of the svg.

Hackathons

- 2021 Solana's Ignition Hackathon, Malloc Protocol (devpost)

- 2021 TartanHacks, Paint4D

- 2020 TartanHacks, DinexDaddy (devpost)
won *Best Financial Hack (Capitol One)* and *Best Focus on Customer Hack (Panopto)*

- 2019 Hack112, SpotiMood (*3rd Place)*

  Developed a Spotify playlist generator based on mood-detection extracted from user's webcam

- 2019 RedRobot (*1st Place*)

  Engineered an Arduino powered PlayStation RC robot to navigate a competitive obstacle course

Relevant Coursework

Functional Programming, Computer Systems, Computer Vision, Deep Learning, Learning-Based Image Synthesis, Foldable Robotics, Interactivity and Computation

Awards/Honors

2022, Graduated with University Honors and College Honors, Carnegie Mellon
F19, F20, S21, S22, CMU Dean's List
2020, Summer Undergraduate Research Fellow (SURF Grant)
2019-2022, National Merit Scholarship, Allergan Foundation
2019, Salutatorian, Council Rock North
2018, AP Scholar with Distinction, College Board