

Monalisa Malani

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[LinkedIn](#) | [Website](#) | [GitHub](#)

EDUCATION

Carnegie Mellon University

Master of Science in Sustainable and Computational Design
(GPA: 4.07/4.00)

Pittsburgh, PA, USA
Aug 2021 – May 2023

Manipal University (MAHE)

Bachelor of Architecture
Top 5 percentile (GPA: 3.86/4.00 WES ICAP)

Manipal, India
Jun 2014 – May 2019

RESEARCH & PUBLICATION

Masters' Thesis Research

Evaluation and mapping of **sidewalk material** data and **walkability** by performing **semantic segmentation** on **street-level imagery**, **GIS**, and **deep learning** framework. Advisors: Prof. [Claudio Silva](#) (NYU) and Prof. [Filip Biljecki](#) (NUS).

ongoing

Scopus Publication

- Paper on "[Planning for Surface Public Transportation](#)"
 - Presented at MAHE's Interdisciplinary Conference on Healthcare and Technical Research (2017)
 - Published in International Journal of Recent Technology and Engineering (IJRTE), ISSN: 2277-3878
- Referred Journal - Engineering Sciences International Research Journal Volume 6 Spl. Issue with ISSN 2320-4338
Compiled and published by International Multidisciplinary Research Foundation (IMRF), India

2018

WORK EXPERIENCE

Machine Learning Intern

Geopipe, Inc.

Project Groundcover: **Image segmentation and inpainting** to identify buildings, roads, paved surfaces, water, and grass on **high-resolution satellite imagery**.

Project Stop-classification: **Binary classification** model to identify the end stage for **Neural Building Printer**.

- Worked on **computer vision algorithms** using **deep learning** to develop a detailed **digital twin** of the Earth.
- Implemented **end-to-end** models - **GANs**, **ResNet**, and conducted **experiments** to achieve high performance.
- Performed **data cleaning**, **generation**, **exploration**, and **statistical analysis** to achieve higher confidence in the data.
- Designed and built **dashboards and metrics** to help develop and monitor vision solutions on Tensorboard.

Tools: Python, TensorFlow, Keras, NumPy, Git, AWS

Part-time (Remote)
Sep – Dec 2022

New York, NY, USA
Jun – Aug 2022

Graduate Research Assistant

School of Architecture, Carnegie Mellon University

- **Statistical analysis** of **urban surfaces** and evaluating their impact on the **environment** and urban **sustainability** for [Smart Surface Coalition](#) with PhD candidate [Suzy Li](#). Tools: Python, ArcGIS, Deep Learning Package
- Assisting Prof. [Azadeh Sawyer](#) with her research on Climate Studio **View Analysis** and **Building Performance** in **Virtual Reality**. Tools: Rhino3D, Grasshopper, Climate Studio, Enscape

Pittsburgh, PA, USA
Sep 2022 – Present

Sep 2021 – Mar 2022

Architect

HCP Design, Planning, and Management Pvt. Ltd.

- Conducted **extensive research** to identify common themes and best practices in **urban planning and development**, with a focus on sustainable design, transportation systems, and community engagement as part of the **Research Team**.

Remote
Ahmedabad, India
Sep 2020 – Jul 2021

Creative Head

Graphe (Proprietary)

- **Led a team of designers** to create innovative and visually compelling **digital designs, 3D models, apps, and web interfaces** for a variety of clients and industries, including technology and healthcare.

Kolkata, India
May 2019 – Aug 2021

Junior Architect

Salient Design Studio

- Conducted **analysis and synthesis** of site features, existing conditions, zoning, etc., for an **urban development** project
- Developed zoning options that aligned with the **design program requirements** while managing concurrent **3D modeling and rendering** tasks for other ongoing projects.

Kolkata, India
Jan – May 2020

Design Intern

Taller KEN

- Generated and implemented **design solutions, technical drawings**, and client presentations across various concurrent projects. Successfully competed in and won Alloy Block's Brooklyn **urban intervention competition**.

Guatemala City, Guatemala
Feb – Apr 2019

Architectural Intern

Cadence Architects

- Utilized **diverse design skills** to create **technical, construction, and conceptual drawings, 3D models, walk-throughs, and 2D renders** for a variety of commercial and residential projects, competitions, and publications

Bengaluru, India
Jun 2018 – Jan 2019

PROGRAMMING LANGUAGES & TECHNOLOGIES

- Python, PyTorch, Tensorflow, C++, Numpy, Pandas, OpenCV, C, HTML, CSS, Git, AWS, GCP, ArcGIS, QGIS, Tableau
- Rhino3D, Grasshopper, Revit, SketchUp, AutoCAD, Climate Studio, eQuest, IES-VE, Design Builder, Enscape, Lumion, V-Ray, Adobe Suite, Figma, Unity

SELECTED PROJECTS

3D System and Segmentation for Dental Care

24-678: Computer Vision for Engineers

- Improved the spatial resolution of **dental imagery** by utilizing a **point cloud**-based representation.
- Demonstrated the applicability of **clustering** by performing tooth decay analysis, showcasing its potential in **dental diagnosis**.

[Source Code](#) | [Video Presentation](#)**Learning Deep Learning**

11-685: Introduction to Deep Learning

- Frame-level classification of **Speech using MLP**: To generate predictions for the phoneme state labels using speech recordings.
- Face **Classification Verification**: To discriminate and generalize **feature representations** using ResNet and **ConvNeXt** (from scratch).
- **Language modeling** for **speech recognition** using **RNNs, GRU, and GANs**.

Beat Striker

15-112: Fundamentals of Programming and Computer Science

- Developed a **Python-based rhythm game** with **3D motion graphics** inspired by the popular Beat Saber game. The game utilized a **webcam** to capture and track the **player's movements** during gameplay. Additionally, a custom **3D engine** was developed to power the game's graphics and visual effects.

[Source Code](#) | [Video](#) | [Details](#)**Space Runner**

99358: Introduction to the Unity Game Engine

- Created a **Unity game** demonstrating **collision, spawning, and scene management** features through a two-dimensional infinite gameplay experience.

[Source Code](#) | [Video](#)**Plastic Pollution**

05839: Interactive Data Science

- Developed a **web app** with an **end-user-focused data-centric experience** and incorporated linear **regression** using scikit learn for predictions.

[Exploratory Data Analysis](#) | [Web App - Streamlit](#)

ADDITIONAL EXPERIENCE & AWARDS

Graduate Merit Scholarship

School of Architecture, Carnegie Mellon University

Pittsburgh, PA, USA
Mar 2021, Mar 2022**Winner - Robotic Fabrication**

Institute of Advanced Architecture of Catalonia (IaaC, Barcelona)

1:1 fabrication competition held during IaaC's DigitalFUTURES.World Workshops

Recipient of 20% scholarship to study Masters in Robotics and Advanced Construction

Barcelona, Spain
Jul 2020**Academic Excellence**School of Architecture and Planning, Manipal University: Design Topper (4th, 6th Semester), Batch Topper (4th Semester)Manipal, India
2014 - 2019

GRADUATE COURSE

Spring 2023 - 15-662: Computer Graphis (C/C++); 16-824: Visual Learning and Recognition (PyTorch); 90-765: Cities, Technology, and Environment; 48-732: Thesis, 48-569: GIS (ArcGIS)**Fall 2022** - 11-685: Intro to Deep Learning (PyTorch); 24-678: Computer Vision for Engineers (OpenCV); 48-731: Thesis Prep (Semantic segmentation for urban analytics); 48-700: Practicum - Geopipe, Inc. (TensorFlow)**Spring 2022** - 15-122: Principles of Imperative Computing (C); 48-770: Intro to Machine Learning in Design (PyTorch); 62-706: Generative Systems (GHPython); 48-524: Building Performance Modeling (eQuest, IES-VE, Design Builder); 48-711: Paradigms of Research in Architecture**Fall 2021** - 15-112: Fundamentals of Programming and Computer Science (Python); 05-839: Interactive Data Science (Python - Pandas, Matplotlib, Seaborn, Tableau, Streamlit); 48-733: Environmental Performance Simulation; (Climate Studio, Ladybug), 48-783: Generative Modeling (GhPython); 48-743: Ecological Design and Thinking; 99-355: Arduino (C++); 99-358: Unity (C#)

ONLINE LEARNING

Computing: 3D Modelling using Python/Rhinoscript

Coursera (Verified Track) – University of Michigan. Tutor: Glenn Wilcox

Mar 2021

Building as Sustainable Energy Systems

edX (Verified Track) – ECObuild1x Energy Demand in Building. Tutors: Laure Itard, Dr. Paula van den Bromv

Sep 2020