Pratheba Selvaraju

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Current Position

Research Assistant, *Max Planck Institute for Intelligent Systems - Perceiving Systems* ⬈   Tübingen, Germany
(directed by Dr.Michael J.Black ⬈)   February 2025 – Present

Research Interest

- Geometry processing and shape deformation in 3D graphics and vision.
- 3D reconstruction using generative modeling approaches (Diffusion).
- Digitial twin creation with novel view synthesis approach (Gaussian splatting).
- Design pattern and 3D modeling for sustainability efforts.
- Applications of 3D vision in world modeling, robotics, and real-world interactive systems.

Education

Ph.D. *University of Massachusetts, Amherst*, Computer Science   Massachusetts, 2018 – 2024
Thesis: Exploring Representations for 3D Reconstruction from Impaired Real-World Data ⬈ , directed by Prof. Erik G.Learned Miller ⬈

M.S *Columbia University*, Computer Science   New York, 2011 – 2012

Work Experience

Research Intern, *Roblox*   California, 2024
Shape deformation : Template garment adaptation to different Roblox Avatars
- *Geometry processing, ARAP*

Research Intern, *Microsoft*   Washington (Remote), 2022
3D face reconstruction : From single view images
- *Diffusion models*

Software Engineer Intern, *Google*   California (Remote), 2022
3D object detection: Identification of building parts from LIDAR point clouds and images
- *Implicit model, Point cloud Segmentation*

Research Intern, *Meta*   Washington (Remote), 2020
Virtual object placement: Placement of virtual TV panels in virtual oculus environment
- *AR/VR*

Software Engineer, *IMO*   California, 2017
Software Engineer, *Machine Zone*   California, 2016
Software Engineer, *Microsoft*   Washington, 2013-2016

Publications

- OFER: Occluded Face Expression Reconstruction ⬈   CVPR, 2025
  Pratheba Selvaraju ⬈, Victoria Fernández Abrevaya, Timo Bolkart, Rick Akkerman, Tianyu Ding, Faezeh Amjadi, Ilya Zharkov

- FORA: Fast-Forward Caching in Diffusion Transformer Acceleration ⬈   ArXiv, 2024
  Pratheba Selvaraju ⬈, Tianyu Ding, Tianyi Chen, Ilya Zharkov, Luming Liang

- Developable Approximation of Neural Implicits via Rank Minimization ⬈   3DV, 2024
  Pratheba Selvaraju ⬈

- A 3D digitisation workflow for architecture-specific annotation of built heritage ↗ JASREC, 2021

  Marissia Deligiorgi, Maria I Maslioukova, Melinos Averkiou, Andreas C Andreou, **Pratheba Selvaraju** ↗,
  Evangelos Kalogerakis, Gustavo Patow, Yiorgos Chrysanthou, George Artopoulos

- BuildingNet:Learning to Label 3D Buildings ↗ ICCV, 2021 **(Oral)**

  Pratheba Selvaraju ↗, Mohamed Nabail, Evangelos Kalogerakis, Siddhartha Chaudhuri

Ongoing Projects

- **Shape Deformation with style preservation** First Author

  Adaptation of a geometry and style to topologically and morphologically different shapes.

- **3D Garment synthesis from in-the-wild images** Second Author & Collaborator

  Defining new domain specific language (DSL) using LLM's and garment parametric model for accurate garment synthesis from in the wild images.

- **VOFER: Video & Audio based occluded face expression reconstruction** External Instructor

  Extension of OFER ↗ to multi-modal input of audio and video sequence.

Students

- Dharmendra Selvaratnam ↗: *University of Plymouth, London*

Professional Activities

Reviewer

- IEEE Conference on Computer Vision and Pattern Recognition (CVPR)
- IEEE International Conference on Computer Vision (ICCV)
- IEEE European Conference on Computer Vision (ECCV)
- Transactions on Pattern Analysis and Machine Intelligence (TPAMI)
- SIGGRAPH
- SIGGRAPH Asia
- Internation Conference of 3D Computer Vision (3DV)
- Transactions on Visualization and Computer Graphics (TVCG)
- International Journal of Computer Vision (IJCV)

Skills

- **Programming** Python, C++
- **Framework** Pytorch, Numpy, Scipy

Keywords

- 3D Computer Vision, 3D Computer Graphics
- 3D reconstruction, Dataset creation, Knowledge Graph
- Generative modeling, Implicit reconstruction, Fast transformer, Geometry Processing
- Large Language Models (LLM), Vision Language Models (VLM)