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

- NGL-Prompter: Training-free Sewing Pattern Estimation from Images — Under review, 2026
  Anna Badalyan*†, **Pratheba Selvaraju †**, Victoria Fernández Abrevaya, Omid Taheri, Michael Black
- 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.
- **VOFER: Video & Audio based occluded face expression reconstruction** Corresponding Author
  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)