

# Aashish Rai

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## Education

- **Brown University** **Providence, RI, USA**  
*Doctor of Philosophy (PhD), Computer Science,*  
Advisor: Srinath Sridhar *Fall 2023 - 2028 (expected)*
- **National Institute of Technology** **Surat, India**  
*Bachelor of Technology (B.Tech), ECE,* *Aug 2017 - June 2021*

## Research Experience

- **Meta Reality Labs** **Burlingame, CA, USA**  
**Summer Intern** (*Computer Vision Engineer - CW*), (*Hosted by: Aayush Prakash*)  
*May 2024 - present*  
Proposed a novel representation for 3D Gaussian Splatting to solve the permutation invariance and spatial structure problems. The new representation enables the application of existing 2D image based models (autoencoder, diffusion models, etc.) on Gaussian Splatting directly.
- **Robotics Institute, Carnegie Mellon University** **Pittsburgh, PA, USA**  
**Research Assistant** (*Advisor: Fernando De la Torre*)  
*Sept 2021 - May 2023*  
(in collaboration with **Meta Reality Labs**)  
**[Project 2:]** ■ A novel framework to generate realistic 3D Faces by leveraging 2D face generative models. Demonstrated its application in semantic face manipulations and text-based editing in 3D faces.
  - Outperformed SOTA in 3D shape reconstruction and preserving the identity of rendered faces.**[Project 1:]** ■ A 3D face generative model to decouple identity and expression and get granular control over expressions and identity.
- **McGill University** **Montreal, Canada / Online**  
**Research Intern** (*Advisor: Jeremy Cooperstock*)  
*May 2020 - Mar 2021*  
Improved Semantic Face Editing by manipulating the latent space of StyleGAN2.
  - Proposed an automated way of disentangling one feature from the other in the latent space by taking orthogonal projection.
  - Used multi-class SVM classifier for complex attributes like race, face shape, etc.
- **Norwegian Biometrics Laboratory, NTNU** **Norway / Online**  
**Undergraduate Researcher** (*Advisor: Kishor Upla, Christoph Busch*)  
*Dec 2019 - May 2020*  
Designed an efficient face super-resolution model using progressive residual CNN network.
  - Proposed a three module framework to generate 8x images from 8x8, 16x16, 24x24 low resolution images.
  - The model outperformed on benchmark datasets CelebA (PSNR: 26.55) and LFW (PSNR: 26.26).
- **Indian Space Research Organization (ISRO)** **Dehradun, India**  
**Summer Intern** (*Advisor: Anil Kumar*)  
*May 2019 - July 2019*  
Implemented computationally efficient algorithms for classification of Panchromatic and Multispectral satellite images using CNN.
- **Machine Learning and Computer Vision (ML-CV) Lab, SVNIT** **Surat, India**  
**Undergraduate Researcher** (*Advisor: Kishor Upla*)  
*Jan 2019 - Nov 2019*  
A face recognition model for an unconstrained environment using CNN and transfer learning.

## Research Papers

- **Aashish Rai**, Dilin Wang, Mihir Jain, Nikolaos Sarafianos, Arthur Chen, Srinath Sridhar, Aayush Prakash, "UVGS: Reimagining Unstructured 3D Gaussian Splatting using UV Mapping", (in submission).
- **Aashish Rai**, Srinath Sridhar, "EgoSonics: Generating Synchronized Audio for Silent Egocentric Videos", (WACV 2025). [\[Link\]](#)
- **Aashish Rai**, Hires Gupta, Ayush Pandey, Francisco Vicente Carrasco, Shingo Jason Takagi, Amaury Aubel, Dael Kim, Aayush Prakash, Fernando de la Torre, "Towards Realistic Generative 3D Face Models", (WACV 2024). [\[Link\]](#)
- Fariborz Teherkhani, **Aashish Rai**, Shaunak Srivastava, Quankai Gao, Xuanbai Chen, Fernando de la Torre, Steven Song, Aayush Prakash, Dael Kim, "Controllable 3D Generative Adversarial Face Model via Disentangling Shape and Appearance", (WACV 2023). [\[Link\]](#)

- **Aashish Rai**, C. Ducher and Jeremy. Cooperstock, "*Improved Attribute Manipulation in the Latent Space of StyleGAN for Semantic Face Editing*," 20<sup>th</sup> IEEE International Conference on Machine Learning and Applications (ICMLA), 2021, Pasadena, CA, USA [[Link](#)]
- **Aashish Rai**, V. Chudasama, Kishor Upla, K. Raja, R. Ramachandra and Christoph Busch, "*ComSupResNet: A Compact Super-Resolution Network for Low-Resolution Face Images*," 2020 8th International Workshop on Biometrics and Forensics (IWBF), Porto, Portugal, 2020, pp. 1-6. [[Link](#)]  
(Extended version is accepted in IEEE Transactions on Biometrics (T-BIOM))