Aashish Rai

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EDUCATION

- **Brown University** — **Providence, RI, USA**
  Doctor of Philosophy (PhD), Computer Science, — *Fall 2023 - 2028 (expected)*
  Advisor: Srinath Sridhar
- **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 - Dec 2024*
  - Proposed a novel 2D representation for 3D Gaussian Splatting to solve permutation invariance and unstructured nature of 3DGS primitives.
  - 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 generative face 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.

PUBLICATIONS/SUBMISSIONS

- **Aashish Rai**, Dilin Wang, Mihir Jain, Nikolaos Sarafianos, Arthur Chen, Srinath Sridhar, Aayush Prakash, *"UVGS: Reimagining Unstructured 3D Gaussian Splatting using UV Mapping"*, (CVPR 2025). [**Link**]
- **Aashish Rai**, Srinath Sridhar, *"EgoSonics: Generating Synchronized Audio for Silent Egocentric Videos"*, (WACV 2025). [**Link**]
- **Aashish Rai**, Hiresh 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^{th} 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))