Nisarg Anish Shah

+1 443-790-4020 ◇ nisargshah1999.github.io ◇ snisarg812@gmail.com

EDUCATION

Ph.D. in Electrical and Computer Engineering — Maryland, USA
Johns Hopkins University — *2022 - 2026*
Advisor: Dr. Vishal Patel

B.Tech. in Electrical Engineering — Rajasthan, India
Indian Institute of Technology Jodhpur — *2017 - 2021*
Advisors: Dr. Anil Kumar Tiwari, Dr. Himanshu Kumar

POSITION

Research Intern — May 2025 – August 2025
Amazon Web Services, Amazon, Inc. — *Los Angles, CA*

Research Intern at AWS AI/ML supervised by *Pengkai Zhu*, *Srikar Appalaraju*, *Ankan Bansal*, and building preference-aligned LLM agents for code and computer use—planning API toolchains and executing GUI actions

Research Intern — June 2024 - Nov 2024
Netflix, Inc. — *Los Gatos, CA*

Research Intern at Netflix supervised by *Amir Ziai*, *Chaitanya Ekanadham*, *Benjamin Klein* working on Long-Video (Multi-modal) LLMs and improving reasoning capabilities

Research Engineer, Computer Vision — July 2021 - July 2022
AI Foundation — *San Francisco, CA, Remote*
Prev: Research Intern — Mar 2021 - July 2021,

Research Engineer at the AI Foundation Science supervised by *Dr. Gaurav Bharaj* working on efficient Generative Models for rendering purposes

Research Intern — Apr 2020 - Sep 2020
National University of Singapore — *Singapore*

Research intern at the School of Computing supervised by *Dr. Angela Yao*. Worked on development of novel training and dataloader sampling strategies to mitigate the issue of long-tail classification for Action Recognition.

PUBLICATIONS

1. **Nisarg A Shah**, Amir Ziai, Chaitanya Ekanadham, Vishal M Patel. **"Cinéaste: A Fine-grained Contextual Movie Question Answering Benchmark "**. *[Under Review]*
2. **Nisarg A Shah**, Shameema Sikder, S. Swaroop Vedula, Vishal M. Patel. **"StepAL: Step-aware Active Learning for Cataract Surgical Videos"**. *International Conference on Medical Image Computing and Computer Assisted Intervention (MICCAI), 2025*
3. **Nisarg A Shah**, Mingze Xia, Subhasri Vijay, Shameema Sikder, S. Swaroop Vedula, Vishal M. Patel. **"A Vision Foundation Model for Cataract Surgery Using Joint-Embedding Predictive Architecture"**. *Medical Imaging with Deep Learning (MIDL), 2025*
4. **Nisarg A Shah**, Vibashan VS, Vishal M Patel. **"LQMFormer: Language-aware Query Mask Transformer for Referring Image Segmentation "**. *IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR), 2024*

5. **Nisarg A Shah**, Shameema Sikder, Swaroop Vedula, Vishal M Patel. **"GLSFormer : Gated - Long, Short Sequence Transformer for Step Recognition in Surgical Videos"**. *International Conference on Medical Image Computing and Computer Assisted Intervention (MICCAI), 2023* [Early Accept]

6. **Nisarg A Shah**, Gaurav Bharaj. **"Towards Device Efficient Conditional Image Generation"**. *British Machine Vision Conference (BMVC), 2022* [arXiv]

7. Sauradip Nag*, **Nisarg A Shah***, Anran Qi*, Raghavendra Ramachandra. **"How Far Can I Go ? : A Self-Supervised Approach for Deterministic Video Depth Forecasting"**. *Machine Learning for Autonomous Driving, 35th Conference on Neural Information Processing Systems (NeurIPS), 2021*

8. Sourya Dipta Das, Saikat Dutta, **Nisarg A Shah**, Dwarikanath Mahapatra, Zongyuan Ge. **"Anomaly Detection in Retinal Images using Multi-Scale Deep Feature Sparse Coding"**. *International Symposium on Biomedical Imaging (ISBI), 2022*

9. Aditya Raj*, **Nisarg A Shah***, Anil Kumar Tiwari. **"A novel approach for fundus image enhancement"**. *Biomedical Signal Processing and Control 71 (2022): 103208.*

10. Sourya Dipta Das*, **Nisarg A Shah***, Saikat Dutta, Himanshu Kumar. **"DSRN: an Efficient Deep Network for Image Relighting"**. *IEEE International Conference on Image Processing (ICIP), 2021*

11. Saikat Dutta, **Nisarg A Shah**, Anurag Mittal. **"Efficient Space-time Video Super Resolution using Low-Resolution Flow and Mask Upsampling"**. *New Trends in Image Restoration and Enhancement workshop, IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR), 2021*

12. Saikat Dutta, Sourya Dipta Das, **Nisarg A Shah***, Anil Kumar Tiwari. **"Lightweight model for Bokeh Effect Rendering on Low cost devices"**. *Mobile AI workshop, IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR), 2021*

13. Sourya Dipta Das*, **Nisarg A Shah***, Saikat Dutta. **"MSR-Net: Multi-Scale Relighting Network for One-to-One Relighting"**. *Differentiable computer vision, graphics, and physics in machine learning, 34th Conference on Neural Information Processing Systems (NeurIPS), 2020*

14. **Nisarg A Shah**, Divij Gupta, Romil Lodaya, Ujjwal Baid, Sanjay Talbar. **"Colorectal Cancer Segmentation using Atrous Convolution and Residual Enhanced UNet"**. *Fifth IAPR International Conference on Computer Vision Image Processing (CVIP), 2020*

15. Aditya Raj, **Nisarg A Shah**, Anil Kumar Tiwari, Maria G Martini. **"Multivariate Regression-Based Convolutional Neural Network Model for Fundus Image Quality Assessment"**. *IEEE Access 8 (2020): 57810-57821.*

16. Ujjwal Baid, **Nisarg A Shah**, Sanjay Talbar. **"Brain Tumor Segmentation with Cascaded Deep Convolutional Neural Network"**. *Brain Lesion (BrainLes) workshop, 22nd International Conference on Medical Image Computing and Computer-Assisted Intervention (MICCAI), 2019*

* indicates authors contributed equally to the work.

⇒ Challenge Reports on the last page.

SELECTED PROJECTS

- **Efficient Generative Networks for Faster Rendering**

  Advisor: Dr. Gaurav Bharaj | AI Foundation March 2021 - Present

  – Proposed and implemented various sampling and loss-based methods for solving the problem of Long-tailed distribution of datasets in real world where the number of action classes range in the order of thousands

  – Performed an intensive survey of the state-of-art work done in the field of action recognition mainly for three important datasets i.e. YouTube-8M, CrossTask, and EPIC Kitchens

- **Self-Supervised Learning for Forecasting of 3d motion of Dynamic scene**
  Advisor: Prof. Raghavendra Ramachandra | NTNU, Norway Feb 2021 - Present
  - Proposed a novel self-supervised method to anticipate the depth estimate for a future, unobserved real-world urban scene in an unsupervised manner
  - Estimated the depth of an unobserved frame as a view-synthesis problem, treating it as an auxiliary task while synthesizing back the views using learned pose.

- **Long Tailed Action Recognition**
  Advisor: Dr. Angela Yao | National University of Singapore Apr 2020 - Sep 2020
  - Proposed and implemented various sampling and loss-based methods for solving the problem of Long-tailed distribution of datasets in real world where the number of action classes range in the order of thousands
  - Performed an intensive survey of the state-of-art work done in the field of action recognition mainly for three important datasets i.e. YouTube-8M, CrossTask, and EPIC Kitchens

- **Uncertainty Aware Curriculum Model Adaptation for night time image segmentation**
  HUST, China | Winning solution for UIOU Dark Zurich Challenge, at CVPR'20 Apr 2020 – Dec 2020
  - Proposed a framework using concepts like pseudo label generation, and unsupervised image-to-image translation to mitigate performance degradation observed under adverse weather and illumination conditions
  - Formulated framework included an Uncertainty aware method for rectifying semantic predictions and spatial prior assisted method for making pseudo labels more reliable

- **Real-time Single and Multi-scene Deep Image Relighting**
  Advisor: Dr. Himanshu Kumar | IIT Jodhpur, India Jan 2020 – Apr 2020
  - Proposed a robust network for translating image color temperature from input-to-target image and also for generation of light gradient with respect to the target image
  - Resulting multi-scale architecture is highly efficient in terms of run-time and memory-usage, and could be easily deployed in low-cost mobile devices

SKILLS

- **Languages**: Python, C++, C, LaTeX, MATLAB, HTML5, CSS
- **Tools and Technologies**: PyTorch, Keras, Tensorflow, OpenCV, Scikit-learn, Git, jQuery, JSON
- **Environment**: Mac, Linux, Windows

RELEVANT COURSEWORK

Computational Imaging, Calculus and Linear Algebra, Complex Analysis and Differential Equations, Machine Learning*, Fundamentals of Computer Vision*, Probability Statistics and Random Processes, CS 231n: CNNs for Visual Recognition*, Deep Learning specialization*, Digital Logic and Design, Electrical Machines, Data Structures and algorithms*, Object-oriented Programming*, Computer Networks*

* indicates Massive Open Online Courses(MOOCs)

ACHIEVEMENTS

- Presented the winning solution of UIOU Dark Zurich Challenge at Vision for all Seasons: Adverse Weather and Lighting Conditions Workshop at CVPR, 2020
- Among 0.5% of the applied students (approximately 11,00,000) across India to clear Joint Entrance Examination -Advanced (IIT-JEE)
- Successfully cleared *KVPY* examination, 2017
- Ranked in top 20 of Gujarat Secondary Education Board Exam amongst 900,000 candidates

POSITIONS OF RESPONSIBILITY

- Secretary, Hostel Cultural and Literary Society , IIT Jodhpur

  - Established a non-academic library for the members of the hostel and other aspirants for UPSC examination - India
  - Led a team of 6 members to organize various events to celebrate festivals at hostel level

- Student Volunteer, Alumni Relations Committee, IIT Jodhpur
  - Led a team of three members for creating a detailed database of Alumni for Alumni Relations Committee
  - Facilitated and overseen Travel and Accommodation arrangements of 180 Alumni and their parents for Convocation'18, IIT Jodhpur with 2 other team members.

CHALLENGE REPORTS

- "NTIRE 2021 challenge on video super-resolution". *New Trends in Image Restoration and Enhancement workshop on image and video restoration and enhancement, IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR), 2021*
- "Fast and accurate quantized camera scene detection on smartphones". *Mobile AI Workshop, IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR), 2021*
- "AIM 2020: Scene Relighting and Illumination Estimation Challenge". *Advances in Image Manipulation workshop, European Conference on Computer Vision (ECCV), 2020*
- "AIM 2020 Challenge on Rendering Realistic Bokeh". *Advances in Image Manipulation workshop, European Conference on Computer Vision (ECCV), 2020*
- "NTIRE 2020 Challenge on Real Image Denoising: Dataset, Methods and Results". *New Trends in Image Restoration and Enhancement workshop on image and video restoration and enhancement, IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR), 2020*