BISHSHOY DAS

Indian Institute of Technology Delhi · Dolby Laboratories · NVIDIA
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EXPERTISE

Tech stack - Python, C / C++, PyTorch, JAX, Docker.
Research stack - Diffusion models, Gaussian splats, Neural Radiance Fields, Vision transformers, State space models, Super-resolution, Model optimization, Generative adversarial networks.

EXPERIENCE

Dolby Laboratories — Senior AI Researcher
Bangalore, Karnataka · May 2023 – Present

I worked on image enhancement, 6DoF video modeling and compression, in-painting advertisement assets using diffusion models.

NVIDIA — System Software Engineer
Pune, Maharashtra · 2016

I developed linux APIs for low-level camera hardware stack on NVIDIA Tegra line of embedded systems.

EDUCATION

PhD — Electrical Engineering
Indian Institute of Technology Delhi · *2017 – 2022*
Deep Learning, Convolutional Neural Networks, Pruning, Gradient Analysis, Algebraic Topology.
Thesis - Improvements in Learning Capacities of Convolutional Neural Networks.
GPA - 8.23 / 10

MTech — Electrical and Electronics Engineering
Indian Institute of Technology Guwahati · *2014 – 2016*
Signal Processing, Machine Learning, Linear Algebra, Calculus, Probability Theory and Statistics.
GPA - 8.47 / 10

BTech — Electronics and Communications Engineering
Heritage Institute of Technology, Kolkata · *2009 – 2013*
GPA - 8.29 / 10

Research Internship
Hiroshima University, Japan · *2018 and 2019*
I developed super-resolution algorithms for high FPS cameras.

Graduate Aptitude Test in Engineering (All India Entrance Exam)
Secured a rank of *99.77th percentile* across more than 216,367 candidates.

PROJECTS

Text to HDR image / video content generation, Diffusion models
Implementation of ICtCp color profile awareness in text-2-video diffusion models.

Inversion and training free methods for MMDiT based video editing models
Implementation of training and inversion free video editing pipelines of MMDiT video diffusion models such as CogVideoX or Qwen Video Edit.

SSM-based 3D predictor model for stereo and flow downstream tasks
Alleviate transformer's nature of quadratic memory and compute complexity using a Mamba state-space model and transformer hybrid that reduces compute time by up to 30% with similar levels of performance and enable high resolution 3D prediction on stereo and flow downstream tasks.

Advertisement insertion in dynamic sports video content, Diffusion models
Implemented simple advertisement banner insertion on courts of indoor and outdoor sports events that remains temporally consistent and visually appealing, with client agnostic metadata that can deliver hyper-personalized advertisement to viewers with light metadata packet.

PROJECTS (CONTINUED)

ResNet based predictive Neural Radiance Fields, 6 DoF video compression, 3D Gaussian Splatting, Novel View Synthesis
Implemented a residual network-based radiance field predictor that compresses 6 DoF images and videos, leading to 10% to 50% bitrate savings.
Implemented transport of 6 DoF images using HEVC.
The method was later successfully adapted in 3D Gaussian Splatting compression as well.

Fast Reference Image Super-Resolution, Image Quality Enhancement
Implemented a 100x faster than SOTA pipeline for a transformer-based image super-resolution algorithm that draws texture information from a reference texture provider image.

Development of camera pipelines API, Linux C / C++ programming
Development of Camera2 API pipeline for NVIDIA Tegra devices.

SELECTED PUBLICATIONS

AD-Relight: Training-Free Banner Relighting via Illumination Translation with Diffusion Priors
R Mishra, **B Das**, AV Subramanyam, GM Su
2026 IEEE International Conference on Multimedia and Expo Workshops (ICME-W)

Novel Feature Prediction Using Residual Networks for Planar-Decomposition Based Dynamic Scene Radiance Fields
B Das, GM Su
2025 IEEE International Conference on Image Processing Workshops (ICIP-W)

On Characterizing the Evolution of Embedding Space of Neural Networks using Algebraic Topology
S Suresh, **B Das**, V Abrol, SD Roy
2024 Pattern Recognition Letters (PRL)

Feature Independent Filter Pruning by Successive Layers Analysis
M Mondal*, **B Das***, B Lall, P Singh, SD Roy, SD Joshi
2023 Computer Vision and Image Understanding (CVIU)
* shared first author

Edge-Aware Image Super-Resolution Using a Generative Adversarial Network
B Das, SD Roy
2023 SN Computer Science (SNCS)

Multi-band Convolutional Neural Network for Efficient Utilization of Model Parameters
M Mondal, **B Das**, B Lall, P Singh, SD Roy, SD Joshi
2023 International Conference on Computer, Electronics & Electrical Engineering and Their Applications (IC2E3)

Altering Backward Pass Gradients improves Convergence
B Das, M Mondal, B Lall, SD Joshi, SD Roy
2023 The 35th International Conference on Software Engineering and Knowledge Engineering (SEKE)

Adaptive CNN Filter Pruning Using Global Importance Metric
M Mondal*, **B Das***, SD Roy, P Singh, B Lall, SD Joshi
2022 Computer Vision and Image Understanding (CVIU)
* shared first author

Knowledge Diversification in Ensembles of Identical Neural Networks.
B Das, SD Roy
2022 British Machine Vision Conference (BMVC)

Graph-Based Depth Estimation in a Monocular Image Using Constrained 3D Wireframe Models
B Das, HPJ Dutta, MK Bhuyan
2020 International Conference on Computer Vision and Image Processing

PATENTS

4 patents pending

THESIS

Improvements in Learning Capacities of Convolutional Neural Networks
B Das
2022 PhD Thesis, Indian Institute of Technology Delhi