

Anshuk Uppal

AI Researcher | Deep Learning & Generative Models

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Professional Summary

AI Researcher specializing in generative models, uncertainty quantification, and controllable generation. Published at NeurIPS (Spotlight, <3%) and ICML with 4+ years across Microsoft Research, Sony AI, NYU, and RIKEN-AIP. Expert in diffusion models, multimodal architectures, and alignment—building real-world image, video, and audio generation systems.

Key Publications

Implicit Variational Inference for High-Dimensional Posteriors (NeurIPS 2023 Spotlight)

A. Uppal, K. Stensbo-Smidt, W. Boomsma & J. Frellsen

Novel approach to scalable posterior approximations for uncertainty quantification in very deep neural networks.

Denoising Multi-Beta VAE: Representation Learning for Disentanglement

A. Uppal, Y. Takida, C-H. Lai & Y. Mitsufuji

Pioneered novel non-linear diffusion framework for controllable generation. [Preprint available](#)

Flow Map Learning via Games

M. Goldstein , A. Uppal, R. Singhal, A. Puli & R. Ranganath

Fast and efficient multi-step sampling techniques for continuous normalising flows.

Research Experience

Research Scientist Intern

Microsoft Research

June 2025 - October 2025

Reading, UK

- Led independent research project on advancing state-of-the-art **image editing** capabilities using leading foundation models (Stable Diffusion 3, FLUX)
- Developing novel techniques for controllable and robust image manipulation at scale using **multimodal models**.

Research Scientist Intern

Sony AI

June 2024 - October 2024

Tokyo, Japan

- Led independent research project on **controllable generation** in novel non-linear Latent Diffusion Models.
- Demonstrated **superior disentanglement and controllability** compared to existing methods
- Output: First-author manuscript under review | [Preprint with 1000+ views](#)

Visiting Research Scholar

New York University

October 2024 - March 2025

New York, USA

- Extended research collaboration with Prof. Rajesh Ranganath's group at CILVR and Courant Institute.
- Pioneered novel **sampling techniques to dramatically improve diversity** in pretrained conditional diffusion models (Stable Diffusion).
- Discovered breakthrough training strategies for continuous normalizing flows and consistency models, **enabling faster sampling**.
- Output: Manuscript under review at a top ML conference.

Research Scientist Intern

RIKEN-AIP

June 2019 - December 2019

Tokyo, Japan

- Scaled Natural Gradient Variational Inference for complex mixture distributions.

- Developed practical approximation techniques bridging Deep Neural Networks and Gaussian Processes.

Education

PhD in Computer Science

Technical University of Denmark

2021 - Present (Expected 2026)

Copenhagen, Denmark

- Research Focus: Uncertainty Quantification and Robustness in Deep Generative Models
- Advisors: Prof. Wouter Boomsma (University of Copenhagen), Prof. Jes Frellsen (DTU)
- Funding: Center for Basic Machine Learning Research in Life Sciences (MLLS)

Master of Technology in Electronics & Communication

IIIT Bangalore

2020

India

- CGPA: 3.65/4.0
- Thesis: Multimodal Posterior Estimation in Bayesian Neural Networks using Natural Gradients (Distinction)

Technical Expertise

Programming & Tools

Python (Expert), C, BASH, Git, Docker

ML Frameworks

PyTorch (Advanced), JAX, Pyro, NumPyro, Hugging Face

Core Expertise

Diffusion Models (Stable Diffusion, FLUX, DDPM/DDIM, LDMs)

Generative Models (VAEs, GANs, Normalizing Flows, Autoregressive Models)

Bayesian ML (Variational Inference, MCMC, Uncertainty Quantification)

Optimization (Natural Gradients, Adam variants, Second-order methods)

Teaching & Services

Reviewer | Machine Learning Conferences

I have served as a reviewer for AABI 2022, NeurIPS 2023 and 2025, ICLR 2023 and 2026 and AISTATS 2022 and CVPR 2025.

Teaching Assistant | Technical University of Denmark

- Deep Learning (02456) - Taught 200+ graduate students over 2 years (Fall 2022, 2023)
- Deep Learning for Industry (Special Course) - Designed curriculum for industry professionals (Dec 2021)

Co-Organizer | Generative Modelling Summer School | Copenhagen 2023

Led organization and provided teaching support for 100+ international participants from academia and industry