Tooba Imtiaz

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Education

Fall 2021 - Present	**PhD Candidate,** Electrical Engineering, *Northeastern University*, Boston	**Advisor:** Prof. Jennifer Dy
2018 - 2020	**Masters,** Electrical Engineering, (**GPA**: 3.87/4.3) *Korea Advanced Institute of Science and Technology (KAIST)*, S. Korea	**Advisor:** Prof. In-So Kweon
2014 - 2018	**Bachelors,** Electrical Engineering, (**GPA**: 3.93/4.0, **Rank:** 5th/156) *National University of Sciences and Technology (NUST)*, Pakistan	**Advisor:** Prof. Faisal Shafait

Work Experience

June 2025 – Present — **Student Researcher** | Google, Pixel Biometrics AI Research (BAIR)
Seattle, WA
- Working on Generative AI with Google Pixel Biometrics team.

Sep 2024 – May 2025 — **Student Researcher** | Google Beam (Project Starline)
Cambridge, MA
- Continued research as an extension of my internship project for Google Beam.
- Proposed a feed-forward, generalizable 3DGS-based novel view synthesis framework capable of reconstructing wide-coverage, high-resolution scenes, achieving state-of-the-art performance in a single inference pass. ("LVT", SIGGRAPH Asia 2025)

May 2024 – Aug 2024 — **Research Intern** | Google Beam (Project Starline)
Playa Vista, CA
- Worked on novel-view synthesis for Google Beam.
- Proposed feed-forward architecture achieved plausible quantitative and qualitative results, despite its simplicity.

Sep 2021 – Present — **Research Assistant** | Machine Learning Lab @ SPIRAL,
Northeastern University, Boston
- Developing a novel view synthesis framework to visualize previously unseen depths in 3D reflectance confocal microscopy (RCM) images of human skin, enabling early detection of skin diseases and cancers.
- Contributed to a regularization-based approach for improving continual learning. ("STAR", ICLR 2025)
- Developed an optimization-based sparse adversarial attack on images and evaluated its interpretability. ("SAIF", TMLR 2025)
- Implemented NeRF-based 3D scene reconstruction from phone camera videos to facilitate at-home patient health monitoring.
- Formulated a clustering-based loss to improve the performance of 3D-object detection from multiview 2D inputs.

Spring 2023 — **Teaching Assistant** | EECE7397 Advanced Machine Learning, Northeastern University

Sep 2020 - Aug 2021 — **Consultant - ML and AI** | Endress+Hauser,
Maulburg, Germany
Proposed ML and CV-based solutions for process automation and optimization. Led two projects, both deployed to production:
- **Deep learning for unsupervised 3D classification:** used Autoencoders, Capsule architectures, and Implicit Neural Networks.
- **Forecasting on time series:** utilized DNNs and Temporal Transformers to predict compound concentrations in liquids using sensors measuring base physical quantities. Achieved $\sim 96\%$ accuracy w.r.t. specialized physical sensors.

Sep 2018 - Aug 2020 — **Research Assistant** | Robotics and Computer Vision Lab,
KAIST, South Korea
- **Bosch-RCV Project:** Performed camera calibration, data collection, and vehicle trajectory estimation. Designed an occlusion-robust vehicle re-identification method using GANs for seamless tracking across a multi-camera surrounding awareness system.
- **Universal Adversarial Perturbations:** Developed novel adversarial attack algorithms. Published at CVPR, AAAI, and ACCV '20.

Sep 2015 - May 2018 — **Research Intern** | TUKL-NUST R&D Centre,
NUST, Pakistan
- Proposed table detection and parsing in document images using ML and CV (LSTMs, text classification, clustering algorithms).
- Implemented LSTMs for handwritten address recognition to sort postal mail.

Publications

LVT: Large-Scale Scene Reconstruction via Local View Transformers | **SIGGRAPH Asia 2025**
T. Imtiaz*, L. Chai*, K. Heal, X. Luo, J. Park, J. Dy, J. Flynn

STAR: Stability-Inducing Weight Perturbation for Continual Learning | **ICLR 2025**
M. Eskander, **T. Imtiaz**, D. Hill, Z. Wang, J. Dy

ADAPT to Robustify Prompt Tuning Vision Transformers | **TMLR 2025**
M. Eskander, **T. Imtiaz**, Z. Wang, J. Dy

SAIF: Sparse Adversarial and Imperceptible Attack Framework | **TMLR 2025**
T. Imtiaz, M. Kohler, J. Miller, Z. Wang, M. Eskandar, M. Sznaier, O. Camps, J. Dy

Volumetric Propagation Network: Stereo-LiDAR Fusion for Long-Range Depth Estimation | **IEEE RA-L 2021**
J. Choe, K. Joo, **T. Imtiaz**, I.S. Kweon

Understanding Adversarial Examples from the Mutual Influence of Images and Perturbations | **CVPR 2020**
C. Zhang*, P. Benz*, **T. Imtiaz**, I.S. Kweon

CD-UAP: Class Discriminative Universal Adversarial Perturbation | **AAAI 2020**
C. Zhang*, P. Benz*, **T. Imtiaz**, I.S. Kweon

Double Targeted Universal Adversarial Perturbations | **ACCV 2020**
P. Benz*, C. Zhang*, **T. Imtiaz**, I.S. Kweon

Data from Model: Extracting Data from Non-robust and Robust Models | **CVPRW 2020**
P. Benz*, C. Zhang*, **T. Imtiaz**, I.S. Kweon

Universal Adversarial Perturbations are Not Bugs, They are Features | **CVPRW 2020**
P. Benz*, C. Zhang*, **T. Imtiaz**, I.S. Kweon

Patents

LVT: Large-Scale Scene Reconstruction via Local View Transformers | **Pending**
J. Flynn, L. Chai, **T. Imtiaz**
A generalizable novel view synthesis framework for reconstructing wide-coverage, high-resolution scenes, achieving state-of-the-art performance.

Scholarships and Awards

2020	Qualcomm Innovation Fellowship Award, South Korea (among the 20 awardees)
2014-2018	NUST Merit Scholarship (Awarded to top-3 GPA holders of cohort)
2017	Global UGRAD Exchange Program, US Dept of State ($\sim$ 7.6% selection rate)

Skills

Python	JAX, PyTorch, Tensorflow, Keras, Numpy, scikit-learn, cuda, Matplotlib
C / C++ / Java	Object-oriented programming, Data structures, frontend and backend dev
Misc.	MATLAB, Unix, gcc, Git, SQL, LaTeX, ROS, AutoCAD

Academic Service

Workflow Chair	AAAI 2024 - Managed the AAAI 2024 paper review process for 12,100 submissions, working with 7k reviewers, 765 senior program committee (SPC), and 320 area chairs (AC). - Used topic modeling and text similarity to determine reviewer, SPC, and AC assignments.
Conference Reviewer	AAAI 2026, NeurIPS 2025, ICLR 2025, ECCV 2024, CVPR 2024, ACCV 2024, ICCV 2023
Volunteer	ICML 2022