

Uddeshya Upadhyay

✉ uddeshya.upa@gmail.com • [udion.github.io](https://github.com/udion)

Education

- Ph.D. in Computer Science,**
International Max Planck Research School for Intelligent Systems
University of Tübingen + Max Planck Institute for Intelligent Systems Jan 2021 – present
- Master of Technology,**
Indian Institute of Technology (IIT) - Bombay
Computer Science and Engineering,
*(**Excellence in Research Award**)* July 2015 – July 2020
- Bachelor of Technology,**
Indian Institute of Technology (IIT) - Bombay
Computer Science and Engineering July 2015 – July 2020

Publications

* represents equal contribution. Latest work @ [GoogleScholar/uddeshya](https://scholar.google.com/citations?user=uddeshya)

J = Journal, C = Conference, W = Workshop

- **[C6]: Uncertainty-Guided Progressive GANs for Medical Image Translation** [under review]
Uddeshya. U, Yanbei. C, Tobias. H, Sergios Gatidis, Zeynep Akata
- **[C5]: Uncertainty-aware Generalized Adaptive CycleGAN** [under review]
Uddeshya. U, Yanbei. C, Zeynep Akata
- **[J1]: Towards Ultra-Low-Dose PET using Deep Learning with Out-Of-Distribution Robustness** [under review]
Viswanath. S*, Uddeshya. U*, Gary F. Egan, Zhaolin. C, Suyash P. Awate, *Medical Image Analysis (MedIA) Journal*
- **[W1]: QUEST for MEDISYN: Quasi-norm based Uncertainty ESTimation for MEDical Image SYNthesis** [paper]
Uddeshya. U*, Viswanath. S*, Suyash P. Awate, *International Conference on Machine Learning - Workshop on Uncertainty and Robustness in Deep Learning (ICML-UDL), 2020*
- **[C4]: Compact Representation Learning using Class Specific Convolution Coders - Application to Medical Image Classification** [paper]
Uddeshya. U, Biplob. B, *IEEE International Symposium on Biomedical Imaging (IEEE ISBI), 2020, Iowa, USA*
- **[C3]: A Mixed Supervision Multilevel GAN framework for Image Quality Enhancement** [paper]
Uddeshya. U, Suyash. P. Awate, *Medical Image Computing and Computer Assisted Intervention (MICCAI), 2019 MICCAI Undergraduate Student Travel Award, Shenzhen, China*
- **[C2]: Spinal Stenosis Detection in MRI with Modular Coordinate Convolutional Attention Network** [paper]
Uddeshya. U, Badrinath. S, Meenakshi. S, *IEEE International Joint Conf. on Neural Networks (IEEE IJCNN), 2019 (Full oral presentation), Budapest, Hungary*
- **[C1]: Robust Super-Resolution GAN, with Manifold-based and Perception Loss** [paper]
Uddeshya. U, Suyash. P. Awate, *IEEE International Symposium on Biomedical Imaging (IEEE ISBI), 2019 In top 10 papers eligible for Best Paper Award, (Full oral presentation), Venice, Italy*
- **Transformer Based Reinforcement Learning For Games**
Uddeshya. U, Nikunj. S, Sucheta. R, Mayanka. M, arxiv.org/abs/1912.03918
- **Removal of Batch Effects Using Generative Adversarial Networks**
Uddeshya. U, Arjun. J, arxiv.org/abs/1901.06654

Patents

- **[202021036972] Systems and Methods for Automatically Enhancing Low-dose PET Images with Robustness to Out-of-Distribution (OOD) Data** [patent pending]
Viswanath. S, Uddeshya. U, Gary F. Egan, Zhaolin. C, Suyash P. Awate

Professional Experience

Research Intern

Microsoft Research

Bangalore
Sep 2020 – Dec 2020

- Worked on low-cost smartphone-based retinoscopy device to be used at scale
- Built an android app to capture the visual and IMU sensor data, used in tandem with portable retinoscope
- Designed image-processing, sensor-fusion, and machine learning based algorithms to aid diagnosis of various eye conditions

AI Scientist

Synapsica (YCombinator-2020)

Bangalore
Nov 2019 – Sep 2020

- Worked on ML based products for Spinal MRI and Digital Motion X-ray analysis
- Built state-of-the-art Bayesian Deep Learning based models for mensuration analysis of Radiographs
- Developed domain-adaptation based techniques to train models with limited data

Research Intern

Tokyo, Japan

Honda Research Institute

Summer-2018

- o Worked on deep learning models for sequential tagging problems in NLP and unsupervised language models
- o Developed experimental model to extract character level features using capsule network for NER
- o Proposed residual connection based algorithms for NLP, inspired by computer vision tasks achieving competitive results on POS tagging, but faster than RNN based methods

Research Intern

Singapore

NTU-Singapore, Supervisor: Prof. Anupam Chattopadhyay

Summer-2017

- o Designed and implemented a library capable of performing various side channel attacks such as Correlation Power Analysis, Template Attacks, Differential Power Attack, Mutual Information Attack on block ciphers
- o Performed template attacks from power traces with templates obtained by modeling traces as Multivariate Gaussians

Data Science Intern

Bangalore

Julia Computing

Winter-2016

- o Implemented K-means algorithm to cluster data from multiple files in parallel to boost performance of clustering in JULIA and worked on Generalized Regression Model to predict cost on basis of journey distance, time from New York Taxi Dataset
- o Analyzed variation in pickups and drop-offs with years/month/weekdays/hours in day to discover patterns
- o Did visualization of results on Heatmaps using Google maps API and various 2D and 3D graphing engines

Selected Awards and Honors

- o “**Excellence in Research Award**” by Dept. of Computer Science and Engineering, IIT-Bombay, 2020
- o “**Best Paper Award**” finalist at IEEE International Symp. on Biomedical Imaging (ISBI), 2019
- o Received “**MICCAI Undergraduate Student Travel Award**” for MICCAI, 2019
- o Awarded branch change to **Dept. of Computer Science and Engineering** by IIT-Bombay for exceptional academic performance in 2015-16
- o Secured ranks in **top 2900** in JEE Main and Advanced-2015 out of ~ 1.5 Million Candidates
- o Received a certificate of merit and a letter of appreciation for exceptional performance in the All India Senior School Certificate Examination (AISSE), 2015
- o Selected for Kishore Vaigyanik Protsahan Yojana (KVPY) Scholarship, instituted by the Department of Science and Technology, Govt. of India, with rank in **top 299** out of $\sim 100,000$ Candidates, 2014

Teaching Assistantship

- o Postgraduate course on **Medical Image Computing** 2019, IIT-Bombay
- o Undergraduate course on **Fundamentals of Digital Image Processing** 2019, IIT-Bombay
- o Undergraduate course on **Physics of Biological Systems: NPTEL** 2019, IIT-Bombay
- o Undergraduate course on **Quantum Physics and Applications** 2016, IIT-Bombay

Selected Talks

- o Image-to-Image Translation using Deep Learning: Quest for Robustness and Uncertainty Estimation IIT-Bombay, 2020
- o Uncertainty-aware Robust Key-points Detection for Medical Imaging Synapsica, 2020
- o Mixed-supervision Multilevel GANs for Image Quality Enhancement IMPRS-IS Symposium, Tübingen, 2020
- o Robust Generative Adversarial Networks for Super-resolution ISBI, Venice, 2019
- o Residual Networks for NLP HRI-Japan, 2018
- o Using Hypersphere Embeddings based on Triplet Loss for Face Recognition and Clustering Fractal Analytics, 2018
- o Side Channel Attacks using Julia NTU-Singapore, 2017

Selected Open-source Contributions

- o **Transformer-RL**: Transformer Based Reinforcement Learning For Games, [\[code\]](#)
- o **Pose2Action**: Action Recognition using Poses, [\[code\]](#)
- o **Neurapse**: Open source library for Simulating Spiking Neural Networks (SNNs), [\[code\]](#)

Technical Skills

- o **Programming Languages**: Python, Matlab, Julia, Octave, C, C++, Java
- o **Web, APIs, and App Dev**: HTML, CSS, Javascript, Django, Android
- o **Tools & Libraries**: Tensorflow, Pytorch, Keras, FluxML, git, TeX