# Aditya Agarwal

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## EDUCATION

**International Institute of Information Technology Hyderabad**  Hyderabad, India
*Masters by Research in Computer Science and Engineering; GPA: 9.83/10.0 (Top 2%)*  *Aug 2021 - Current*

Relevant Coursework: Mobile Robotics, Speech Signal Processing, Topics in Applied Optimization

**PES University (formerly PES Institute of Technology)**  Bangalore, India
*Bachelor of Engineering in Computer Science and Engineering; GPA: 9.31/10.0 (Top 10%)*  *Aug 2013 - May 2017*

**Kendriya Vidyala**  New Delhi, India
*Class XII AISSCE, CBSE; 94.2% (Top 1.5% in India); Class X AISSE, CBSE; 10.0/10.0 (Top 1% in India)*  *Apr 2010 - Mar 2013*

## EXPERIENCE

**IIIT Hyderabad**  Hyderabad, India
*Research Fellow – Working in the broad areas of Robotics, Generative Modeling and 3D Computer Vision.*  *Feb 2021 - Present*

- **Robotics Research Center**: *Supervised by Professors Madhava Krishna and Srinath Sridhar.*

  * Working on robotic grasping and manipulation directly on continuous implicit representation of 3D shapes.
  * Worked on 3D shape completion of pointclouds in arbitrary poses for improved grasp pose estimation. *[ICRA 2023]*
  * Leading a group of four undergrad researchers on tabletop manipulation by exploring synergies between pushing and grasping.
  * Developed an end-to-end pipeline for tabletop rearrangement and planning. Secured 3rd place in an international robotics competition Robotic Grasping and Manipulation Competitions hosted by ICRA. *[ICRA 2022]*

- **Centre for Visual Information Technology**: *Supervised by Professors C V Jawahar and Vinay Namboodiri.*

  * Working on generating arbitrarily long videos conditioned on textual priors by utilizing videos parameterized as INRs. A prior network explores meaningful directions in the latent space for generating temporally coherent videos.
  * Supervising a graduate researcher towards building a high-quality video-to-video face-swapping network for movie scenes.
  * Proposed a novel area of video-to-video face-swapping for swapping a double's face (target) with a starring actor's (source) in movie scenes by preserving the facial features and expressions of the source and pose and background features of the target using techniques in blending and generative modeling. Outperformed existing SOTA networks on multiple metrics. *[WACV 2023]*
  * Developed a novel formulation for bootstrapping lipreading training platforms at scale by building on SOTA talking-head generation and TTS models for training hard-of-hearing people to lipread in any accent/language without vocabulary constraints and with real-world variations. *[WACV 2023]*
  * Proposed a novel video representation network where the videos are parameterized as implicit neural representations (INRs). A hypernetwork learns a prior over these INRs. Achieved SOTA performance in several video-based generative tasks. *[TMLR 2022]*
  * Developed a lipreading model for an ALS patient using data augmentation and domain adaptation techniques. *[BMVC 2021]*

**Microsoft India R&D**  Hyderabad, India
*Data Scientist II - Bing Search Technology Center India*  *Jan 2018 - Mar 2021*

- **Related QnA (People Also Ask), Bing STCI**: PAA experience shows a block of related questions and answers on the search page for any given user query. We aid the user in query exploration and reformulation.

  * Developed deep-learning techniques to improve the coverage and relevance of PAA in English, French, and German markets.
  * Worked on universalization techniques to enable PAA in 100+ languages and 200+ markets for millions of users at scale.

- **Azure Health Data Workbench, Azure Global Engineering**: We try to leverage the power of AI and the Cloud to solve some of the challenging problems in the sphere of healthcare in India and the world impacting the lives of millions of people.

  * Built an Azure Data workbench to pull medical health records from on-premise healthcare systems to the cloud performing a series of pre-processing, de-identification and ingestion steps to store data in a secure and queryable format ensuring interoperability.
  * Worked on several data analysis and visualization techniques to draw intelligent insights from the data.

- **Project Sangam - Digital Learning Platform, Azure Global Engineering**: Project Sangam is cloud-hosted, mobile-first community learning platform built to deliver content at large scale.

  * Owned several key areas like setting up the deployment health monitoring framework, API automation, developed the reward based program called Certificates, automated creation of deployments etc. to help us scale quickly and in customer acquisition.
  * Seamlessly on-boarded the Swachhbharat Mission program to our platform which helped train 110,000+ municipal functionaries across 4000+ cities in India on best sanitation practices. The result was a partnership between Microsoft India and Ministry of Urban and Housing Affairs (MoHUA), Government of India that received widespread media coverage, Link.

**IIIT Hyderabad**                                                                                   Hyderabad, India
*Visiting Researcher – Supervised by Professor **Anil Kumar Vuppala***                                 Oct 2019 - Jul 2020

- **Reed**: An Approach Towards Quickly Bootstrapping Multilingual Acoustic Models.
  - * Built a multilingual acoustic model based on convolutional networks operating on raw speech signals to validate the compatibility of different languages in building a robust multilingual system. Achieved SOTA on three low-resource Indic languages. *[SLT 2021]*

**VMWare India R&D**                                                                                  Bangalore, India
*Member of Technical Staff*                                                                            Jul 2017 - Dec 2017

- **Workspace One - SSO vIDM for VMWare's SAAS offering**: Workspace One is a digital platform that delivers and manages any app on any device by integrating access control, application management and multi-platform endpoint management.
  - * Worked on automating several release pipelines and processes ensuring the highest quality of code in the production systems.

**Microsoft Research**                                                                                Bangalore, India
*Research Intern*                                                                                     Nov 2016 - May 2017

- **Second Opinion**: Second Opinion is a medical application platform to detect the onset of an oncoming serious illness.
  - * Developed a platform to connect patients with doctors from multi-specialty hospitals in India. Implemented several ML models to predict commonly occurring diseases in patients in India from their medical history and lab tests.
  - *This work was done in collaboration with the Microsoft Intelligent Network for Eyecare (MINE), Microsoft India Development Center*

**University of Calgary**                                                                             Calgary, Canada
*MITACS Research Intern – Supervised by Professor Mike Smith*                                          May 2016 - Aug 2016

- **The Ranchlands Hum**: A low-frequency audio noise nuisance plaguing the residents of the Ranchlands community of Calgary.
  - * Developed a low-cost smartphone application to store and analyze low-frequency audio noise data using techniques in DSP.
  - * Developed techniques to perform large scale calibration of android device microphones, code.

**Microsoft Research**                                                                                Bangalore, India
*Software Engineering Intern*                                                                         Nov 2015 - May 2016

- **MEC - Massively Empowered Classrooms**: MEC is a flagship project developed by Microsoft Research India designed to explore how online educational content and techniques in blended learning can be used for undergraduate education in India. MEC
  - * Worked on automating several data retrieval tasks and providing insights into data with interactive data visualization techniques.
  - * Worked on developing and deploying this platform for education in Mauritius called Virtual Campus which was launched as a *partnership between Microsoft Research India and Mauritius Institute of Education that received widespread media coverage*.

## PUBLICATIONS

- **SCARP: 3D Shape Completion in ARbitrary Poses for Improved Grasping, project page**:
  Bipasha Sen*, **Aditya Agarwal***, Gaurav Singh*, Brojeshwar B., Srinath Sridhar, Madhava Krishna
  *IEEE International Conference on Robotics and Automation (ICRA), 2023*

- **Towards MOOCs for Lip Reading: Using Synthetic Talking Heads to Train Humans in Lipreading at Scale, project page**:
  **Aditya Agarwal***, Bipasha Sen*, Rudrabha Mukhopadhyay, Vinay Namboodiri, C V Jawahar
  *IEEE/CVF Winter Conference on Applications of Computer Vision (WACV), 2023*

- **FaceOff: A Video-to-Video Face Swapping System, project page**:
  **Aditya Agarwal***, Bipasha Sen*, Rudrabha Mukhopadhyay, Vinay Namboodiri, C V Jawahar
  *IEEE/CVF Winter Conference on Applications of Computer Vision (WACV), 2023*

- **INR-V: A Continuous Representation Space for Video-based Generative Tasks, OpenReview, project page**:
  Bipasha Sen*, **Aditya Agarwal***, Vinay Namboodiri, C V Jawahar
  *Transactions on Machine Learning Research (TMLR), 2022*

- **Approaches and Challenges in Robotic Perception for Table-top Rearrangement and Planning, paper**:
  **Aditya Agarwal***, Bipasha Sen*, Shankara Narayanan V*, Vishal Reddy Mandadi*, Brojeshwar Bhowmick, K Madhava Krishna
  *Arxiv, 2022*

- **Rethinking Approaches to Training Humans with Hearing Loss in Lipreading**:
  **Aditya Agarwal**, Bipasha Sen, Rudrabha Mukhopadhyay, Vinay Namboodiri, C V Jawahar
  *Provisional Patent 2021*

- **Personalized One-Shot Lipreading for an ALS Patient, paper**:
  Bipasha Sen*, **Aditya Agarwal***, Rudrabha Mukhopadhyay, Vinay Namboodiri, C V Jawahar
  *The British Machine Vision Conference (BMVC), 2021*

- **REED: An Approach Towards Quickly Bootstrapping Multilingual Acoustic Models, paper, presentation**:
  Bipasha Sen*, **Aditya Agarwal***, Mirishkar Sai Ganesh, Anil Kumar Vuppala
  *Spoken Language Technology (SLT), 2021*

- **An Approach Towards Action Recognition using Part Based Hierarchical Fusion, paper, presentation**:
  **Aditya Agarwal\***, Bipasha Sen\*
  *International Symposium on Visual Computing (ISVC), 2020*

- **Minimally Supervised Sound Event Detection using a Neural Network, paper, poster**:
  **Aditya Agarwal**, Syed Munawwar Quadri, Savitha Murthy, Dinkar Sitaram
  *International Conference on Advances in Computing, Communications and Informatics (ICACCI), 2016*

  *\* indicates equal contribution* | Full publication list at Google Scholar | Project details at skymanaditya1.github.io

## ADDITIONAL EXPERIENCE & ACHIEVEMENTS

- Selected in a highly competitive pool of applicants to attend the fully-funded Google Research Week at Bangalore, 2023.
- Secured 3rd place in the International Robotics Competition on Table-top Rearrangement and Planning (OCRTOC), ICRA, Link, 2022
- Selected among 6000+ employees at Microsoft for a video shoot conducted for Microsoft's campus hiring program, Link, 2020
- Awarded *Delight Your Customer, Azure Global Engineering, Microsoft*, for being among the top performing employees in the org., 2018
- Winners at VMWare Global Relay Open Source Borathon; a global hackathon across all teams from VMWare. Link, 2017
- Received *Academic Distinction Award* for exceptional academic performance for consistently scoring 9+ CGPA on a grade scale of 10, 2013-17
- Awarded *MITACS Globalink Award,* for carrying out a fully funded summer research internship at The University of Calgary for the year 2016.
- Co-Founded the *Official Android Community* of PES University called AndroidLabs., 2015
- Won the Best Application Award at Ayana'15 (a 24-hour hackathon)., 2015
- Won the *Best Paper Presentation Award* at NCACCT'15., 2015
- Awarded *Certificate of Excellence* by CBSE for being among the top 0.1% of successful candidates of AISSCE 2013 in Computer Science, 2012
- Recipient of INSPIRE scholarship (deferred) for academic performance within top 1% of successful candidates of AISSCE 2013
- Represented the country as an *Indian delegate* during a fortnight long Exchange Program at Nagano and Tokyo as part of the *JENESYS Program* in Nov'11., 2011
- Extra curricular: Drummer Keyboard and Tabla player *(distinction)*, Fitness Enthusiast, Traveler, Badminton player.

## ACADEMIC SERVICE

- Reviewer for Neural Fields Workshop at ICLR 2023 (NF2023).
- Reviewer for IEEE International Conference on Robotics and Automation (ICRA) 2023
- Coordinator for 6th Summer School on AI (CVIT, IIITH), 2022
- TA for CSEDU-ML Workshop conducted jointly by IIIT-H, IIT-H, and IIT-D
- Coordinator for 5th Summer School on AI (CVIT, IIITH), 2021