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Radhika Dua

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Education

KAIST, Republic of Korea *2020-2022*
Masters, Graduate School of AI CGPA: **4.05/4.3**
- **Outstanding Performance**
- Thesis Topic: Task agnostic and post-hoc unseen distribution detection.
- Advisor: Professor Edward Choi.
- Committee: Professor Jaegul Choo, Professor Jaesik Choi.

Panjab University, Chandigarh, India *2015-2019*
Bachelor of Engineering With Honours, Information Technology **CGPA: 9.24/10**
- **Third position** in the department.

Research Experience

Google DeepMind / Google Research *Predoctoral Researcher* *Sept 2022 - Present*
- Mentors: Dr. Gaurav Aggarwal, Alok Talekar, Ishan Deshpande, Dr. Sujoy Paul
- Agricultural Landscape Understanding (ALU)
  - Leading the **ALU Project**, which aims to segment agriculture-related feature types by utilizing satellite imagery.
  - Enhanced data handling by addressing **class imbalance**, **scarcity of unlabeled data**, and **domain generalization** challenges due to geographic and temporal distribution shifts.
  - The project was presented in AGU 2023 as an oral presentation, Google Research Conference 2023, Google I/O 2023 [demo], Google I/O Connect India 2023 [video], Google For India 2022 [video, G4I blog, project blog].
- One Shot Segmentation
  - Developing an innovative segmentation technique capable of **learning effectively from a single labeled instance**.
  - Objective is to **circumvent the conventional model training process** for segmentation tasks, which typically requires the annotation of extensive datasets.
  - Performance **comparable to Visual Prompting methods** that are trained on tasks relevant for segmentation.

EdLab, KAIST *Student Researcher* *Aug 2020 - Aug 2022*
- Mentors: Professor Edward Choi
- Reliability of Deep Neural Networks
  - Developed a simple yet effective, task-agnostic and post-hoc unseen distribution detection method, which was accepted at **WACV 2023** and the **ARROW workshop in ECCV 2022**.
  - Designed a novel task for detecting attribute-based shifts, developed a dedicated dataset, and formulated an innovative approach, **currently under review at an A* conference**.
- ML for Healthcare
  - Investigated Federated Learning's practical applications in healthcare, which was accepted at **CHIL 2023**.
  - Proposed a method for detecting noisy ECG signals, enhancing precision in cardiology, presented at **ICPR 2022**.

Brown University *Summer Intern* *July 2020 - Sept 2020*
- Mentors: Professor Srinath Sridhar (Brown Univ) and Professor Leonidas Guibas (Stanford Univ).
- Canonicalization of 3D Pose
  - Conducted research on self-supervised canonicalization of 3D pose for full and partial shapes.
  - Paper accepted for a poster presentation to **CVPR 2022**.

Indian Institute of Technology Hyderabad, India *Visiting Researcher* *Jan 2019 - June 2020*
- Mentor: Professor Vineeth N Balasubramanian
- ViQAR: Visual Question Answering and Reasoning
  - Conducted research in Vision and Language applications and introduced a new task, ViQAR: Visual Question Answering and Reasoning, which focuses on automatic generation of the answer, and of a rationale, given a visual query.
  - Paper accepted for a poster presentation to **MULA workshop, CVPR 2021**.

Publications

Conference Publications

- **Radhika Dua**, Seongjun Yang, Yixuan Li, Edward Choi. **TAPUDD: Task Agnostic and Post-hoc Unseen Distribution Detection**, ***WACV 2023***. [paper]
- Seongjun Yang, Hyeonji Hwang, Daeyoung Kim, **Radhika Dua**, Jongyeup Kim, Eunho Yang, Edward Choi **Towards a Practical Utility of Federated Learning in the Medical Domain**, ***Conference on Health, Inference, and Learning (CHIL) 2023***. [paper]
- Rahul Sajnani, Adrien Poulenard, Jivitesh Jain, **Radhika Dua**, Leonidas Guibas, Srinath Sridhar. **ConDor: Self-Supervised Canonicalization of 3D Pose for Partial Shapes**, ***CVPR 2022***. [paper, website]
- Taehee Kim, ChaeHun Park, Jimin Hong, **Radhika Dua**, Edward Choi, Jaegul Choo. **Reweighting Strategy based on Synthetic Data Identification for Sentence Similarity Comparison**, ***COLING 2022***. [paper]
- **Radhika Dua***, Divyam Madaan*, Prerana Mukherjee, Brejesh Lall. **VayuAnukulani: Adaptive Memory Networks for Air Pollution Forecasting**, ***GlobalSIP2019***. [code, paper, slides]

Workshops

- **Radhika Dua**, Seongjun Yang, Yixuan Li, Edward Choi. **TAPUDD: Task Agnostic and Post-hoc Unseen Distribution Detection**, ***ARROW Workshop, ECCV 2022***. [paper]
- **Radhika Dua**, Jiyoung Lee, Joon-myoung Kwon, Edward Choi. **Automatic Detection of Noisy Electrocardiogram Signals**, ***International Workshop on Pattern Recognition in Healthcare Analytics, ICPR 2022***. [paper]
- **Radhika Dua***, Sai Srinivas*, Vineeth N Balasubramanian. **Beyond VQA: Generating Multi-word Answer and Rationale to Visual Questions**, ***MULA Workshop, CVPR 2021***. [paper, video, slides, poster]

Abstract Presentations

- **Radhika Dua**, Alex Wilson, Shubhika Garg, Gaurav Singh, Alok Talekar, Gaurav Aggarwal, Gopi Prashanth Ramineni, Bindiya Kurle. **Agricultural Landscape Understanding At Scale**, ***American Geophysical Union, AGU 2023***. [**Oral presentation**] [abstract]
- Alok Talekar, Aravindan Krishnan, **Radhika Dua**, Alex Wilson, Gopi Prashanth Ramineni, Arnab Basu. **Policy Driven Growth In Water Infrastructure By SmallHolder Farmers**, ***American Geophysical Union, AGU 2023***. [**Lightening presentation**] [abstract]
- Ishan Deshpande, Bhartendu Pandey, **Radhika Dua**, Amandeep Kaur, Alok Talekar, Anu Ramaswami. **AgroForestry in India - Towards Country Wide Finescale Carbon Accounting**, ***American Geophysical Union, AGU 2023***. [**Poster presentation**] [abstract]
- Karan Choudhary, Chintapalli Srirama Srirama Murthy, Sunil Kumar Dubey, **Radhika Dua**, Dinesh Tewari, Alok Talekar. **Crop analytics at field parcel level using multi-resolution satellite images, segmentation and mapping techniques: Towards a transformative solution for crop surveys**, ***American Geophysical Union, AGU 2023***. [**Poster presentation**] [abstract]
- Chintapalli Srirama Srirama Murthy, Sunil Kumar Dubey, Karan Choudhary, **Radhika Dua**, Ishan Deshpande, Alok Talekar. **Mapping tree cover over farm parcels and assessing the scope for agro-forestry development using high resolution satellite images and segmentation techniques**, ***American Geophysical Union, AGU 2023***. [**Poster presentation**] [abstract]

Preprints

* denotes equal contribution

- **Radhika Dua***, Jeonghoon Park*, Jimin Hong*, Daehoon Gwak, Yixuan Li, Jaegul Choo, Edward Choi. **Natural Attribute-based Shift Detection**, *Arxiv 2021*. [paper]
- **Radhika Dua**, Nikita Saxena, Aditi Agarwal, Alex Wilson, Gaurav Singh, Hoang Tran, Ishan Deshpande, Amandeep Kaur, Gaurav Aggarwal, ... , Alok Talekar, **Agricultural Landscape Understanding At Country-Scale**, *Arxiv 2024*. [paper]

Awards and Scholarships

- Recipient of the **KAIST International Students Scholarship** from 2020 to 2022.
- Recipient of the prestigious **Grace Hopper Celebration India (GHCI)** 2018 Student Scholarship given to 250 deserving women students from computing, engineering, and IT backgrounds.
- Awarded **Second Prize in Celestini Project India** by **Marconi Society and Google** for our project on Air Pollution Prediction. **Celestini Project India 2018** is a very competitive internship program where only 8 out of 100 extremely talented applicants are selected.
- Recognized as **India's 91 Brightest Engineering Student** by Economic Times Campus Stars 2018-19. It was a four-phase program in which 91 students out of total 37,000 students were selected.
- **Hackathons:** Won hackathons like **Hack In The North 2017**-The largest student hackathon in India (Prize: **Second**), **Hack Infinity 2017** (Prize: **Second**) and **India Hacks 2017** by Hacker Earth (Prize: **Sixth** out of 35000).

Teaching Experience

- Teaching Assistant for **Scientific Writing (CC500)** and **Graduate English Presentations** (HSS583) at KAIST instructed by Prof. Mik Fanguy.
- Teaching Assistant for **Deep Learning for Computer Vision** offered by Prof. Vineeth N Balasubramanian on NPTEL (National Programme on Technology Enhanced Learning) platform.
- Teaching Assistant for **Deep Learning for Computer Vision** (CS5370) and **Advanced Topics in Machine Learning** (CS6360) at IIT Hyderabad instructed by Prof. Vineeth N Balasubramanian.

Talks and Sessions

- Gave a **lightening talk** on ***Agricultural Landscape Understanding at Scale*** in Google Research Week 2024.
- Gave an **oral talk** on ***Agricultural Landscape Understanding at Scale*** in AGU 2023.
- Presented our work on ***Agricultural Landscape Understanding at Scale*** at the **Google Booth** in AGU 2023.
- Gave a **keynote talk** on ***Towards Sustainable Agriculture prioritizing Global South using Machine Learning*** in IISC open day 2023.
- Speaker at **codechef campus chapter UIET** (2016-17) where I took programming sessions for junior year students.
- Speaker at **Software Freedom Day 2017**, Panjab University, which aims to motivate the junior year students to contribute to open source software and pursue an education in STEM fields.

Professional Activities

- Volunteer at the **Google DeepMind booth** during **ICML 2024**.
- Volunteer at the **Google Networking Event** and **Google Booth** during ICCV 2023.
- Reviewer / Subreviewer for **CVPR 2025**, **ECCV 2024**, **AAAI 2024**, **ICVGIP 2024**, **ICCV 2023**, **ECCV 2022**, **CVPR 2022**, and **SDM 2020**.
- Reviewer for **Grace Hopper Celebration (GHC) 2020** Scholarship.
- Volunteer for virtual conferences: **ICML 2021**, **ICML 2020**, and **ACL 2020**.
- Mentor at **Climate Tech Startup Meet 2023** by Google.
- Poster Mentor at **Women in Machine Learning (WiML)** workshop, NeurIPS '20.
- Mentor at **Hacksprint** version2 Hackathon at Panjab University, Chandigarh.
- **Fellow Campus Ambassador** in **Campus Geek Ambassador program by GeeksforGeeks** (2017-18).

Additional Research Experience

Celestini Project India *Research Intern* *June 2018 - Aug 2018*

- **Mentors:** Dr. Aakanksha Chowdhery (Google Brain and Tensorflow) and Prof. Brejesh Lall (IIT Delhi).
- Real-time Air Pollution Forecasting
  - Developed a temporal forecasting solution based on the historical data reported by Central Pollution Control board to predict the real-time and fine-grained air quality information in five locations of Delhi.
  - Blog post, Indian press and Demo youtube video.
  - Paper accepted for a poster presentation to GlobalSIP 2019.