Geetika Vadali

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Education

- **Indira Gandhi Delhi Technical University for Women (IGDTUW)** — Delhi, India
  BTech in Computer Science and Engineering with Artificial Intelligence — *Aug. 2021 – May 2025*
  CGPA: **9.133/10**

- **Central Board of Secondary Education** — Delhi, India
  Senior Secondary - 94% , Secondary - 98.2% — *June 2021 , June 2019*

Research Experience

- **Mitacs Globalink Research Intern**: Northern Institute for Deep Learning in Ultrasound Lab, University of Alberta, Edmonton, Canada ∼ *May 2024 - now*
  - Research Internship supervisor - Prof. Abhilash R. Hareendranathan
  - Trained and integrated a **Deep Reinforcement Learning (DRL)** agent to an existing classifier system that facilitates earlier point-of-care diagnosis for rotator cuff tear. Was responsible for the **reward function formulation and training**.
  - The DRL agent summarized ultrasound videos to contain only the diagnostically important frames that aid more accurate and fast analysis. Proposed a solution outperformed existing classifier systems which work solely on deep learning and segmentation.
  - Selected among 50+ interns to present my internship work as a Three-Minute Thesis for an interdisciplinary audience at Research Symposium, University of Alberta.

- **Undergraduate Researcher**: Murty Lab, Georgia Institute of Technology ∼ *December 2023 - April 2024*
  - Modelled experiments to see effects of **adversarial perturbations** on an image throughout its journey inside a ResNet50 and controlling its activation by modifying the degree of perturbations. Work in collaboration with Prof. N Apurva Ratan Murty. Link to code

- **Undergraduate Researcher**: Xu Lab, Carnegie Mellon University ∼ *September 2023 - January 2024*
  - Designed a python script to isolate and segment individual biological cells from given pigmented slide images. In collaboration with Dr. Ali Dabouei. Link to code

Publications

- **Shoulder Rotator Cuff Tear Detection from Ultrasound Videos using Deep Reinforcement Learning**: Associated with my research internship at NIDUS Lab, University of Alberta.
  Under Review at International Symposium on Biomedical Imaging 2025, United States
  - Developed a novel Rotator Cuff Tear Assessment technique using DRL-based video summarization approach. Reward mechanism combines representativeness, diversity and classifier confidence.
  - Reduced training time by 50% and improved classification accuracy of torn versus intact tendon from 82.5% to 85%.

- **Convergence to Nash Equilibrium: A Comparative Study of Rock-Paper-Scissors Algorithms**: June 2023
  IEEE International Conference on Computing, Communication, and Intelligent Systems 2023, Sharda University, India
  - Compared and analysed performances of MCTS, CFR, Q-Learning, DQN, and PPO in cyclical two-player zero-sum Rock Paper Scissors game environment. Examined their convergence rates, exploration-exploitation trade-off and average reward over 500 and 1000 episodes. Code Paper

- **Predicting Optimal Startup Exit Strategies with Ensemble Learning for Venture Capitalists**: Dec 2023
  Springer International Conference on Artificial Intelligence and Speech Technology, IGDTUW, India
  - Proposed an Ensemble Learning model for predicting optimal startup exits that outperforms classical Machine Learning classifiers.
  - Sponsored by DST Curie-AI Project, Government of India and won the best paper award at Springer-AIST'23 from around 300 submissions. Paper

Projects

- **Explainable and Interpretable Breast Cancer Classification**: January 2023 - Link
  - Explored and implemented Random Forest Classifier for the binary classification of categorical and quantitative breast cancer data.
  - Achieved 98.7% test accuracy by utilizing SHAP library, LIME, What-If to interpret the model results finding the most affecting parameters.
- **Formality Style Transfer**: September 2022 - *Guided by Prof. Rishabh Kaushal*
  - Implemented LSTM on the NLP-based Sequence2Sequence problem of formality transfer i.e. conversion of an English informal sentence to an English formal sentence without semantic change. Worked on an extensive literature survey on neural machine translation and transformers, encoder-decoder architecture.

Accomplishments

- **Winner in Wipro Climate Challenge'22** November 2022-February 2023
  Wipro and Climate Collective *Received grant money and incubation support*
  - **Proposed Solution:** : Our solution assures a food storage facility of 'organisation in their stock' and 'optimisation in their flow' using **AI and stock data analytics**. Won the **Top 5 across 1,175 teams** who applied and were invited to the Wipro Earthian Awards, Bangalore. Awarded grant prize of around 1200USD.

Technical Profess

- **Technical Languages**: : Python, Java, R, SQL, HTML, CSS
- **Frameworks and Tools**: : Tensorflow, PyTorch, Keras, Microsoft Office, Bootstrap, Pandas, Numpy, Tableau, Matplotlib, Scikit-Learn, Sympy, CI/CD, Bash Scripting
- **Courses Taken**: : Data Science — Database Management Systems — Operating Systems — Data Structures and Algorithms — Optimization Techniques — Numerical Methods — Computer Networks — Compiler Design — Digital Image Processing
- **Conferences and Summer Schools Attended**: 9th Annual Conference of Cognitive Science, IIT Delhi; Summer School on Federated Learning, IIIT Delhi; Upper Bound Conference, University of Alberta, Amii

Leadership and Volunteering Experience

- **Founding Member of Arc - Data Science Club of IGDTUW**: Founding Director of Operations overlooking the Management, Design, Content and Research Teams. Organised and executed datathons, technical talks and community building activities.
- **Desh Ke Mentor (Mentors of the Nation) program**: Mentored 3 Delhi Government high-school girls for further education in STEM.
- **Event Management Core at Association for Computing Machinery-IGDTUW Student Chapter**: Conducted technical and outreach events in online and offline mode.

Extracurriculars

- **Fine Arts**: Second Division with Distinction diploma holder from Pracheen Kala Kendra, Chandigarh, India.
- **Debating**: Active member in the College Debating Club, participated in 3 national level APDs. Semifinalist in IITD APD 2023.

References

- **Prof. Abhilash RH**: Assistant Professor, Department of Radiology, University of Alberta, Canada
  hareendr@ualberta.ca
- **Prof. Poonam Bansal**: HoD, Department of AI and DS, IGDTUW, New Delhi, India
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- **Dr. Rishabh Kaushal**: Assistant Professor, Department of Information Technology, IGDTUW, New Delhi
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