Syed Mohammed Danish

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Education

- **Indian Institute of Technology(IIT) Patna** — Patna, India
  BTech in Electrical and Electronics Engineering; ***CGPA: 8.03/10.00*** — *Nov 2021 – May 2025 (Expected)*
- **Saiyyid Hamid Senior Secondary School, Boys** — Aligarh, India
  Senior Secondary School Certificate Examinations; ***CGPA: 95.6%*** — *May 2020 – May 2021*

Publications

- **Weak Supervision & Supervised Representation Learning for Drug Response Prediction** *Link*
  Kumar Shubham · Aishwarya Jayagopal · ***Syed Danish*** *· Prathosh AP · Vaibhav Rajan*
  41^{st} International Conference on Machine Learning (**ICML 2024**)
- **A Unified $\alpha - \eta - \kappa - \mu$ Fading Model based Real-Time Localization on IoT Edge Devices** *Link*
  Aditya Singh · ***Syed Danish*** *· Gaurav Prasad · Sudhir Kumar*
  IEEE Transactions on Network Science and Engineering (**IEEE TNSE**)
- **Graph Coarsening Techniques for Analysis of Gigapixel Histopathological Images** *Link*
  Ekta Srivastava · ***Syed Danish*** *· Kumar Arjun · Manoj Kumar · Syed Farhan Abbas Et al.*
  6^{th} Workshop on Graphs in Biomedical Image Analysis (**GRAIL - MICCAI 2024**)
- **Quantum Convolutional Neural Networks based Human Activity Recognition using CSI**
  Syed Danish *· Sudhir Kumar*
  17^{th} International Conference on COMmunication Systems & NETworkS (**COMSNETS 2025**)

Work Experience

- **Vision and AI Lab, IISc Bengaluru** — Bengaluru, India
  Research Intern, Advisor: Prof. R. Venkatesh Babu — *May 2024 - August 2024*
  - Goal was to **reconstruct 3D models** of **large-scale scenes** through **Federated Learning**
  - Worked with **3D Gaussian Splatting (3DGS)** to capture **scene structure** and **color distribution**
  - Devised a **Level-of-Detail** based merging strategy for decentralized client models
  - Used **Python, Pytorch**
- **Machine Intelligence Signal and Network (MISN) Lab, IIT Delhi** — Delhi, India
  Research Intern, Advisor: Prof. Sandeep Kumar — *January 2024 - February 2024*
  - Implemented **graph coarsening algorithms** for **cell graph compression**, reducing graph size by **50%** while preserving topology in **gigapixel histopathological images**.
  - Reduced the average Region of Interest (RoI) size **from 10.4 MB to 1.4 MB** and **halved the node count**, accelerating processing for **multi-class breast cancer subtyping** on the **BRACS** dataset.
  - Achieved an **F1 score of 0.67** and **outperforming** SOTA models for **5-class cancer classification**.
  - Skills and Frameworks: **Graph ML, Graph Coarsening, Linux, DGL, Pytorch**
  - Co-authored a paper which was accepted at **GRAIL - MICCAI 2024**
- **Representation Learning Lab, IISc Bengaluru** — Bengaluru, India
  Research Intern, Advisor: Prof. Prathosh A P — *May 2023 - October 2023*
  - Developed **WISER**, a framework using **weak supervision** and **domain-invariant representation learning** to **predict cancer drug response**, improving AUROC by up to **15.7%**
  - Addressed issues such as Data Distribution drift and scarcity in drug response data
  - Implemented a **pseudo-labeling** mechanism with **majority-vote-based weak supervision**, followed by **subset selection using Z-scores** to reduce noise in unlabeled patient data
  - Worked with **Python**, **PyTorch**
  - Co-authored a paper which was accepted at **ICML 2024**

Projects

- **Quantum Neural Network Compression for CSI based Human Activity Recognition**
  Bachelor Thesis Project, Advisor: Dr. Sudhir Kumar *September 2024 - Present*
  - Implemented a **Hybrid quantum-classical neural network** for **Wi-Fi CSI-based human activity recognition**, leveraging **quantum parallelism** and **classical scalability** for efficient feature extraction
  - Implemented **QNN compression** techniques, including **gate pruning** and **parameter quantization**, reducing circuit depth to enhance performance on NISQ hardware.
  - Worked with **Python, IBM-Qiskit**
- **Indoor Localization using $\alpha - \eta - \kappa - \mu$ Fading Model — IoT**
  Design Lab Project, Advisor: Dr. Sudhir Kumar *January 2024 - April 2024*
  - Implemented a 4 parameter real-time localization algorithm on a **Raspberry Pi Zero W**
  - Co-authored a paper accepted at **IEEE Transactions on Network Science and Engineering**
  - Worked with **Linux, Python, C++**
- **Lunar Image Super Resolution** *Github*
  11^{th} *Inter IIT Technical Meet* *December 2023*
  - Used a DeepCNN **single-image super-resolution (SISR)** reconstruction method based on **channel-space attention (CSA)** to achieve **high-resolution lunar surface images**
  - Employed **downsampled OHRC** (Orbiter High Resolution Camera) images
  - Developed a two-stage model, splitting reconstruction between **Low-Res to 4x** and **4x to 16x**
  - Achieved **SSIM** Results of **0.81 for Model 1 (Low-Res to 4x)**, **0.9 for Model 2 (4x to 16x)** and **0.86 for the combined** Model 1 and Model 2 with Fine Tuning
  - Skills and Frameworks: **Python, Numpy, OpenCV, SciPy, Matplotlib, Pytorch**

Accomplishments

- Achieved an All India Rank of **3** out of over **75,000+** participants in the **Amazon ML Challenge 2024**
- Secured an All India Rank of **5547** out of over **1,40,000** candidates in **JEE Advanced** 2021
- Ranked in **top 0.6 percentile** out of more than **1.1 million** candidates in **JEE Mains** 2021.

Skills/Relevant coursework

- **Programming Languages/Frameworks:** C/C++, Python, Git/GitHub, HTML, CSS, Linux, MATLAB
- **Python Libraries:** NumPy, Pandas, Matplotlib, Scikit-Learn, PyTorch, PyTorch-Geometric, DGL
- **Professional Skills:** Computer Vision, Deep Learning, Image Processing, Competitive Programming, DSA
- **Courses taken:** Programming and Data Structures, Introduction to Data Science, Python Programming, Probability Theory and Random Processes, Financial Analytics, Number Theory, Digital Signal Processing, Biomedical Signal Processing, Foundations of Machine Learning

Extra-Curricular Activities

- **NJACK - ML**, **Sub-Coordinator**: Took multiple learning/coding sessions (to over 200 students)
- 11^{th} **Inter-IIT Tech Meet**: Represented IIT Patna in the **Chandrayaan Moon Mapping Challenge**
- Achieved **2nd** place in Inter-year Table Tennis Tournament at IIT Patna 2023
- **National Service Scheme (NSS):** Spearheaded **cleanliness drives**, **COVID-19 awareness sessions**, and **collection camps for clothing and books**, benefiting underprivileged children. Organized **blood donation camps**, driving community engagement and boosting participation.