

Sanjana Srivastava

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EDUCATION

University of Virginia <i>Master of Science in Data Science</i>	Ongoing May 2025
Indian Institute of Technology, Roorkee <i>Master & Bachelor of Technology in Geological Technology, Minor in Mathematics</i>	CGPA: 8.202 July 2022

EXPERIENCE

Research Scientist , University of Virginia, VA <i>Advisors - Dr. Sana Syed, Dr. Donald E. Brown</i> <ul style="list-style-type: none">Worked with a multi-disciplinary team of medical professionals and engineers to study gut functionsResearched and implemented novel Deep Learning models for disease diagnosis and quantificationUsed Machine Learning for pattern recognition in tissue images, clinical data, and transcriptomic data	2022 – 2024
Software Development Intern , BNY Mellon, India <ul style="list-style-type: none">Implemented functional and unit testing for internal applicationsDeveloped a custom XML to CSV Parser UtilityFixed application and security vulnerabilities of the internal applications	Summer 2021
Software Development Intern , ZestMoney, India <ul style="list-style-type: none">Integrated a Payment Gateway at checkout using SpringBoot & MySQL databaseImplemented a custom user Signup interface using Retrofit (Android) with MVVM architectureDeveloped a Base Adapter to reduce the code redundancy thus maintaining code's usability	Summer 2019

PROJECTS

Evaluating efficacy of synthetic images generated using diffusion models , [Code] <ul style="list-style-type: none">Trained diffusion models to generate histology patches conditioned on nuclei locationsEvaluated the use of synthetic patches for improving downstream segmentation and classification tasks	
Deep learning based detection and visual understanding of diseases using medical imaging data , [Code] <ul style="list-style-type: none">Performed patch-based invasive ductal carcinoma (breast cancer) and gastrointestinal disease detectionImplemented convolutional neural networks (CNN) for classifying whole slide images and biomarker dataImplemented Gaussian clustering methods to identify recurring visual patterns in diseased biopsies	
Humorous image captioning system <ul style="list-style-type: none">Designed a self-attentive encoder-decoder framework to generate humorous captions for imagesTrained an image-conditioned language model on a self-curated meme dataset	
Correlating disease gene signature with imaging data , [Code] <ul style="list-style-type: none">Designed a deep learning framework to identify image features associated with functional gene clustersIdentified important gene signatures and their correlation with visual patterns in biopsies	
Deep learning based semantic segmentation on brain MR images , [Code] <ul style="list-style-type: none">Performed tumor segmentation using a U-Net architecture on MRIsUsed PyTorch for training model on MRIs from The Cancer Genome Atlas (TCGA) lower-grade glioma collection	
Petrographic characterisation of a chondrite sample <i>Advisor - Dr. Nachiketa Rai, IIT Roorkee</i> <ul style="list-style-type: none">Investigated the mineralogy and major element geochemistry of mineral phases present in the chondrite sectionPerformed Electron Probe Micro Analysis to obtain backscattered electron images of the sample	

Buy and sell application | IIT Roorkee

- Developed an intranet application for buying, selling and requesting goods among campus residents
- Features include categorization of goods, subscribing, filtering, and searching based on users input

PUBLICATIONS

- **Efficacy Of Synthetic Histopathological Images In Enhancing Nuclei Segmentation Tasks**
S. Srivastava, A. Shrivastava, S. Rhoads, P.T. Fletcher, S. Syed, D.E. Brown. [Under Review]
- **What Is Normal? Characterization Of Control Pediatric Duodenal Biopsies Using Clinical Data, Machine Learning Image Analysis, And Transcriptomics**
F. Rhoads, J. Sessions, S. Srivastava, F. Zulqarnain, V. Jain, ..., S. Syed. [Poster Presentation] *ESPGHAN 2024*
- **Machine-learning-based integrative-‘omics analyses reveal immunologic and metabolic dysregulation in environmental enteric dysfunction**
F. Zulqarnain, X. Zhao, K. Setchell, Y. Sharna, P. Fernandes, S. Srivastava, ..., S. Syed. [Link] *iScience 2024*
- **What Is Normal? Characterization Of Control Pediatric Duodenal Biopsies Using Clinical Data, Machine Learning Image Analysis, And Transcriptomics**
J. Sessions, F. Rhoads, S. Srivastava, F. Zulqarnain, V. Jain, ..., S. Syed. [Oral Presentation] *DDW 2024*
- **Identifying Metabolic Signatures Of Environmental Enteric Dysfunction In Pakistani Mothers And Children Using Tissue-Specific Metabolic Modeling**
S. Syed, F. Zulqarnain, S. Srivastava, W. Khan, I. Nisar. [Poster Presentation] *Bill & Melinda Gates Foundation Grand Challenges Annual Meeting 2023*
- **What Is Normal? Characterization Of Variations In Control Duodenal Biopsies By Machine Learning Image Analysis**
F. Rhoads, J. Sessions, S. Srivastava, V. Jain, ..., S. Syed. [Poster Presentation] *NASPGHAN 2023*
- **Quantitative Morphometry and Machine Learning Model to Explore Duodenal and Rectal Mucosal Tissue of Children with Environmental Enteric Dysfunction**
M. Khan, Z. Jamil, L. Ehsan, F. Zulqarnain, S. Srivastava, ..., S. Syed. [Link] *ASTMH' 2023*

INTERESTS & COMPETENCES

Interests: Computer Vision, Multimodal learning, Natural language processing, Healthcare/Medical Imaging

Languages: Python, R, C/C++, Java, JavaScript, Kotlin, L^AT_EX

Packages/Tools: PyTorch, TensorFlow, Keras, Django, React, Git, MySQL

AWARDS & ACHIEVEMENTS

- Recipient of **IIT Roorkee Award: Nayyar Award for Excellence in Communication** for winning in a multi-round competition involving debating, speech giving, essay writing, and published writing.
- Recipient of **Indian Ministry of Human Resource and Development (MHRD) Assistantship** for meeting the graduate CGPA criterion, demonstrating academic excellence exceeding the required limit.
- Cleared **Joint Entrance Examination (JEE) with All India Rank 5047 (99.6 percentile)**.

POSITIONS OF RESPONSIBILITY & EXTRA CURRICULARS

- **Project Leader** at Information Management Group - Official Coding Society of IIT Roorkee
- **Editor-in-chief** at Geek Gazette - Official Technical Magazine of IIT Roorkee
- **Actor/Director/Producer** at Dramatics Section, IIT Roorkee
- **Council Member** of Hostel Management at Kasturba Bhawan, IIT Roorkee
- **Team Member** of Table Tennis National Sports Organization, IIT Roorkee