Jasmer Singh Sanjotra

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https://www.linkedin.com/in/jasmer-singh-sanjotra-a05b95250 | https://github.com/TheAlphaJas

https://scholar.google.com/citations?hl=en&user=NUCuUbIAAAAJ

Education

Indian Institute of Technology Indore, B.Tech in Electrical Engineering 2022 – 2026

- CGPA: 9.05/10

Experience

Teaching Assistant, IIT Indore – Indore, IN August 2025 – Present

- TA under Prof. Dibbendu Roy for the course EE319 - Design and Analysis for Communication Systems.
- Assisted in designing and grading challenging quizzes.
- Conducted tutorials on topics including Random Variables, Random Processes, and Queuing Theory.

Developer Intern, Samsung R&D Institute India – Bengaluru, IN May 2025 – July 2025

- Collaborated with the 6G Standards Team to develop novel machine learning–based methods for CSI-RS (Channel State Information Reference Signal) processing.
- Designed and implemented UNet-inspired deep learning architectures, achieving a Normalized Mean Squared Error (NMSE) in the order of 1e-3.
- Work under patent filing process for its potential impact on future 6G physical layer standards.
- Received return offer from Samsung for the Advanced Developer Role.

Research Intern, Prof. M. Tanveer | OPTIMAL Research Group, IIT Indore – IN May 2024 – Present

- Developed LSTMSE-Net, an audio-visual speech enhancement model to isolate and enhance speaker audio in noisy environments.
- Engineered a temporal feature extraction pipeline using RNN and LSTM units to jointly model audio-visual dependencies.
- Achieved a 3× reduction in inference time compared to the baseline model with improvements in speech quality.
- Original paper accepted in InterspeechW 2024. Currently working on an advanced version of the same, using a ConvNeXtV2 based video pipeline and an audio decoder inspired from deep state space modelling.

Research Intern, Prof. Nagendra Kumar | LIPG, IIT Indore – IN May 2023 – Present

- Developed novel U-Net based deep learning models for liver tumor segmentation, handling data pre-processing and creating custom callbacks, metrics, and loss functions.
- Implemented advanced architectures like Squeeze-and-Excitation Networks and Atrous Spatial Pyramid Pooling, achieving a state-of-the-art accuracy of 98%.
- Co-authored a research paper detailing the methods and results. Published in Elsevier Biomedical Signal Processing and Control.

Research Contributor, Dr. Debesh Jha | Northwestern University – IL, USA May 2024 – July 2024

- Implemented various liver tumor segmentation models including DeepLabv3+, UNet, and HiFormer-L on the LiTS dataset using PyTorch and TensorFlow.
- Engineered custom, modular PyTorch data loaders and transformation pipelines for the LITS dataset.
- Source code available at GitHub.

Publications

LSTMSE-Net: Long Short Term Speech Enhancement Network for Audio-visual Speech Enhancement Sep 2024

Arnav Jain, ***Jasmer S. Sanjotra***, Harshvardhan Choudhary, Krish Agrawal, Rupal Shah, Rohan Jha, MD Sajid, Amir Hussain, M. Tanveer

10.21437/AVSEC.2024-8
3rd COG-MHEAR Workshop on Audio-Visual Speech Enhancement (AVSEC), ISCA

Ethical framework for responsible foundational models in medical imaging 2025

Debesh Jha, Gorkem Durak, Abhijit Das, ***Jasmer Sanjotra***, Onkar Susladkar, Suramyaa Sarkar, Ashish Rauniyar, Nikhil Kumar Tomar, Linkai Peng, Sirui Li, Koushik Biswas, Ertugrul Aktas, Elif Keles, Matthew Antalek, Zheyuan Zhang, Bin Wang, Xin Zhu, Hongyi Pan, Deniz Seyithanoglu, Alpay Medetalibeyoglu, Vanshali Sharma, Vedat Cicek, Amir A. Rahsepar, Rutger Hendrix, A. Enis Cetin, Bulent Aydogan, Mohamed Abazeed, Frank H. Miller, Rajesh N. Keswani, Hatice Savas, Sachin Jambawalikar, Daniela P. Ladner, Amir A. Borhani, Concetto Spampinato, Michael B. Wallace, Ulas Bagci

10.3389/fmed.2025.1544501
Frontiers in Medicine, Volume 12, 2025

MNet-SAt: A Multiscale Network with Spatial-enhanced Attention for Segmentation of Polyps in Colonoscopy 2025

Chandravardhan Singh Raghaw, Aryan Yadav, ***Jasmer Singh Sanjotra***, Shalini Dangi, Nagendra Kumar

10.1016/j.bspc.2024.107363
Biomedical Signal Processing and Control, Volume 102, 2025

T-MPEDNet: Unveiling the Synergy of Transformer-aware Multiscale Progressive Encoder-Decoder Network with Feature Recalibration for Tumor and Liver Segmentation 2025

Chandravardhan Singh Raghaw, ***Jasmer Singh Sanjotra***, Mohammad Zia Ur Rehman, Shubhi Bansal, Shahid Shafi Dar, Nagendra Kumar

10.1016/j.bspc.2025.108225
Biomedical Signal Processing and Control, Volume 110, 2025

Projects

rawML - ML Implements from scratch Oct 2024

- Developed a custom ML library implementing neural networks from scratch in Python and NumPy.
- Built core components including jTensor (custom tensor class with gradient tracking), a sequential model structure, and gradient descent optimization.

Reinforcement Learning for Hangman Game Aug 2024

- Designed a Deep Q-Network (DQN)-based agent to play Hangman by predicting optimal letter choices, using RNNs for memory.
- Implemented techniques such as the e-greedy strategy, target policy networks, and dynamic learning rate adjustments, resulting in a model with an 85%+ win rate.

Technical Skills

Languages: C++, Python, MATLAB

Frameworks & Tools: Git, PyTorch, Tensorflow, OpenCV, NumPy, backtesting.py, UnTrade SDK, Pennylane

Operating Systems: Windows, Linux

Other Skills: Competitive Programming, Data Structures and Algorithms, Object Oriented Programming

Achievements

Received IEEE SPS ME-UYR Grant, In collaboration with University of Groningen, Netherlands 2025

Expert on Codeforces, demonstrating strong coding and reasoning ability handle

Selected for Amazon ML Summer School, Amazon MLSS 2024

All India Rank 3002 (out of 200k+ aspirants), JEE Advanced 2022 2022

99.1%ile (out of 800k+ aspirants), JEE Mains 2022 2022

IOQM Certificate of Merit, Indian Olympiad Qualifier in Mathematics 2022