BHANU PRATYUSH MANTHA

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EDUCATION

National Institute of Technology, Tiruchirappalli **Nov. 2021 – June 2025**
Bachelor of Technology in Electronics and Communication Engineering *CGPA : 8.61/10.0*

PUBLICATIONS

- Co-Author: **CVPR2024**: Muhammad Nawfal Meeran, Gokul Adethya T, Bhanu Pratyush Mantha. SAM-PM: Enhancing Video Camouflaged Object Detection using Spatio-Temporal Attention. In proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR) Workshops, 1857–66,2024.
- Co-Author: **IC2E3**: P.V Yeshwanth, Jithin Rajan, Bhanu Pratyush Mantha, Pottabathina Siva, S.Deivalakshmi. Self-Governing Assessment Network (SGAN) Based Super Resolution for CT Chest Images. In 2023 International Conference on Computer, Electronics Electrical Engineering their Applications.

INTERNSHIPS

Carnegie Mellon University **Jan 2024 - Sept 2024**
Xu Labs Research Intern

- Worked on Cryo-ET segmentation using few-shot learning with weak label targets by integrating self-supervised learning techniques like SimCLR and developed sampling strategies to address class imbalance.
- Developed AugMix variant for 3D Cryo-ET data to generate weak segmentation masks and worked on pretraining a Masked Autoencoder using denoising reconstruction task.

SLB **May 2023 – July 2023**
Data Science Intern *Pune, Maharashtra*

- Developed and Trained Segmentation models for Instance Segmentation tasks, utilizing both pre-trained models and adapting Semantic Segmentation architectures and achieved improved results.
- Designed an algorithm that is permutation invariant to reconnect small curve portions obtained during Raster Log Segmentation.
- Developed a new optimization objective function for Raster Log segmentation.

National Institute of Technology, Tiruchirappalli **April 2023 – August 2023**
Research Intern

- Worked on Generative models like SRGAN, ESRGAN for enhancing the quality of Low-Resolution Images
- Presented a paper titled ”Self-Governing Assessment Network (SGAN) Based Super Resolution for Enhancing CT Chest Images” in IEEE Conference under the guidance of Dr S.Deivalakshmi

PROJECTS

Nocaine | *Python, PyTorch,Go,JavaScript* **January 2024**

- Developed an intelligent system that monitors, identifies, and investigates illegal activities hosted on the dark web.
- Designed for distributed deployment, and it’s horizontally scalable.It uses the Microservices architecture with twenty services running together. ML service classifies the content into several illegal classifications based on both Text and Image data.

SAM-PM | *Python, PyTorch* **Nov 2023**

- SAM-PM: Proposed the SAM Propagation Module to adapt SAM to videos with addition of minimal parameters $(< 1M)$.
- Adapted it for the task of video camouflage object detection, on which it surpassed the previous SOTA by a margin of 47%, and got accepted in CVPR 2024 workshops.

Quark Gluon Reconstruction | *Python, PyTorch* **June 2023**

- Developed generative models like Variational Autoencoder, Graph Autoencoders and Diffusion-based models to reconstruct of quark and gluon events.

- Implemented the Denoising Diffusion Probabilistic Model (DDPM) and Denoising Diffusion Implicit Model (DDIM) research paper and conducted a study comparing them.
- Implemented Graph Autoenconder using Graph Convolution Networks to learn better representations for reconstruction

Energy Insights | *Python, PyTorch, HuggingFace* **January 2023**

- Built web application to extract real-time data from various energy-related websites.
- Integrated the BRIO abstractive summarizer to provide concise and insightful article summaries
- Additionally the web app is highly scalable as it uses multithreading extracting 35 articles in 3sec, making it a fast and efficient solution for gathering information.

CrackTrack | *Python, TensorFlow, Java* **January 2023**

- Developed and Deployed an Android application for precise crack detection in images.
- Improved detection accuracy by integrating EfficientNetB0.
- Additionally the model was further optimized through quantization, resulting in decreased size and improved latency for CPU and hardware utilization.

EXPERIENCE

Spider R&D **May 2023 – Present**

Machine Learning Researcher

- AI/ML division of Spider R&D, the official Research and Development club of NIT, Tiruchirappalli is dedicated to pushing the boundaries of AI/ML by exploring cutting-edge technologies and taking part in various hackathons.
- Conducted workshop on Diffusion and Text to Image using Stable Diffusion in college incorporating hands-on coding in PyTorch
- Contributed to multiple machine learning projects and participated in various hackathons like Smart India Hackathon, Schlumberger's New Year Hackathon, etc. and engaged in multiple internal projects

Festember Workshops and Informals **April 2022 – Oct 2023**

Manager

- Festember is a non-profit annual cultural fest of NIT, Tiruchirappalli
- Worked with the team to contact and bring down artists from various domains to conduct workshops for Festember
- Worked to convert best celebrities and artists for RRIFF (Rolling Reels International Film Festival) and was in charge of venue for the artists

RELEVANT COURSEWORK

- Linear Algebra and Calculus
- Real Analysis and Probability Theory
- Digital Signal Processing
- Complex Analysis and Differential Equations
- Signals and Systems
- Statistical Theory of Communication
- Introduction to Artificial Intelligence
- Pattern Recognition

ACHIEVEMENTS

- **Runner Up** of Rajasthan Police Hackathon 1.0
- **Winner** of Smart India Hackathon 2023, conducted by the Government of India
- Achieved **first place** among 1100+ teams from all across the nation at the Schlumberger's New Year Hackathon conducted by Shaastra,IIT Madras
- Achieved **first place** among 500+ teams from all across the nation at the L&T EduTech Hackathon conducted by Shaastra,IIT Madras.