Jitesh **Jain**

UNDERGRAD RESEARCHER | THIRD YEAR UNDERGRADUATE | COMPUTER SCIENCE

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"All progress takes place outside the comfort zone."

Education

Indian Institute of Technology, Roorkee   *Roorkee, India*
B.TECH. IN COMPUTER SCIENCE AND ENGINEERING   *2019 - Exp. 2023*
- CGPA: 9.067/10

Central Academy, Kota   *Kota, India*
GRADE 12 (SENIOR SECONDARY LEVEL)   *2019*
- Percentage: 96.60%

Modern Senior Secondary School, Kota   *Kota, India*
GRADE 10 (SECONDARY LEVEL)   *2017*
- CGPA: 10/10

Experience

Picsart AI Research   *Remote*
RESEARCH INTERN   *June, 2021 - Present*
- Working on developing a Unified Framework for Dense Recognition tasks.
- Published a novel work proposing to add semantic context inside vision transformer-based encoders of any existing semantic segmentation framework to obtain considerable improvement in performance.

SHI Lab, University of Oregon   *Remote*
VISITING STUDENT RESEARCHER   *November, 2020 - Present*
- Working with **Prof. Humphrey Shi**.
- Published a work proposing an inpainting framework using *fast fourier convolutions* which works equally well on structure and texture images, and is competitive with the state-of-the-art methods.

FilterPixel   *Remote)*
ML ENGINEER INTERN   *July, 2020 - September,2020*
- Worked on developing ML models for automating the process of Photo Culling. **[Link]**
- Developed ML models for classifying images based on their exposure, blurriness, etc.
- **[Letter of Recommendation]**

Publications

SeMask: Semantically Masked Transformers for Semantic Segmentation   *December, 2021*
JITESH JAIN | ANUKRITI SINGH | NIKITA ORLOV | ZILONG HUANG | JIACHEN LI | STEVEN WALTON | HUMPHREY SHI   *Picsart AI Research*
- **First** work to study the effect of adding semantic context to hierarchical pretrained vision transformer backbones during fine-tuning for the semantic segmentation task.
- Proposed the SeMask block which can be plugged into any existing hierarchical vision transformer encoder to model the semantic context in the network that shows considerable improvements on various benchmark datasets.
- **[PrePrint] [GitHub]**

DEAP Cache: Deep Eviction Admission and Prefetching for Cache   *September, 2020*
AYUSH MANGAL* | JITESH JAIN* | KEERAT KAUR GULIANI* | OMKAR BHALERAO*   *Vision and Language Group, IIT Roorkee*
- Submission at AAAI 2021 Student Abstract Track.
- **First** time an approach has tried learning all the three policies: Admission, Prefetching and Eviction.
- Unlike, previous methods which relied on past statistics for carrying out cache replacement, we predict future statistics (frequency and recency) and then use an online RL-algorithm for eviction.
- **[PrePrint] [GitHub]**

Projects

Neural Style Transfer: A Technical Report
IIT Roorkee

CSN-526 COURSE PROJECT
January 2022 - April 2022

- Worked on studying the effects of various factors like feature extractors, optimizers, loss functions and initialization techniques on the Neural Style Transfer task
- We also proposed the use of pseudo ground truths for evaluating the performance under different settings. **[GitHub]**

BackBone Profile
Remote

SHI LAB, UNIVERSITY OF OREGON
December 2020

- Most of the Segmentation works use networks pretrained on Imagenet as bacbones for feature extraction.
- Conducted Experiments on various networks like ResNet 18/34/50/101, MobileNetv2, Xception Net used in Segmentation works as backbones to evaluate their inference time performance metrics. **[GitHub]**

ChatBot with Pytorch
IIT Roorkee

SELF-LEARNING PROJECT | VISION AND LANGUAGE GROUP
June 2020

- Chatbots are based on the sequence-to-sequence modeling task.
- Implemented a chatbot using pytorch on the Cornell Movie-Dialogs Corpus dataset using GRUs with an Attention mechanism. **[GitHub]**

VQ-VAE Implementation in Pytorch
IIT Roorkee

SELF-LEARNING PROJECT | VISION AND LANGUAGE GROUP
May 2020

- Implemented **VQ-VAE** from scratch in Pytorch on the MNIST dataset as a self-learning project.
- Derived conclusions based on the training and testing results regarding the encoding of images into a latent space, adding Vector-Quantization to encodings and generating images. **[GitHub]**

Honours & Achievements

2022	**Bronze Medalist,** Awarded the Bronze Medal under Bosch's Age and Gender Detection Track at Inter IIT Tech Meet 10.0. The competition is held every year among all the IITs. **[Link]**
2019	**All India Rank - 252,** Joint Entrance Exam (JEE) Advanced is attempted by more than 230,000 students**[Link]**
2019	**All India Rank - 454,** Joint Entrance Exam (JEE) Main is attempted by more than 1,000,000 students.
2018	**KVPY Fellowship Holder,** KVPY is a highly prestigious National Fellowship awarded by Indian Institute of Science and Government of INDIA to students who show high aptitude in research. **[Link]**
2017	**NTSE Scholarship Awardee,** NTSE is a national level examination for secondary school level to identify and recognize students with high intellect and skills. **[Link]**

Skills

Programming Languages	Python, Java, Dart, Swift, C, HTML, CSS, JavaScript
Packages and Environments	Pytorch, TensorFlow, Keras, Android Studio, Flutter, Numpy, Pandas, Matplotlib, Scikit-learn, OpenCV, Django
Utilities	Git, Linux Shell, Vim
Relevant Courses (online)	Deep Learning Specialization (Coursera), GAN Specialization (Coursera) by DeepLearning.ai
	CS231n (Computer Vision Course) by Stanford University, CS229 (Machine Learning Course) by Stanford University
	Stat 110 (Probability and Statistics) by Harvard University,
Relevant Courses (offline)	Mathematics-I (Linear Algebra and Calculus), Optimisation Techniques
	Discrete Structures, Data Structures and Algorithms, Operating Systems

Extracurricular Activity

Vision and Language Group, IIT Roorkee
Roorkee, India

CO-PRESIDENT
January, 2020 - Present

- Co-President of VLG IITR, a student group that promotes **Deep Learning research culture** at IITR by discussing relevant research papers, organizing workshops and working on related projects.**[Link]**

MDG Space, IIT Roorkee
Roorkee, India

PROJECT MANAGER
January, 2020 - Present

- Project Manager at MDG Space in IIT Roorkee, involved in developing and managing mobile applications in Flutter. **[Link]**

Student Mentorship Program, IIT Roorkee
Roorkee, India

STUDENT MENTOR
October, 2021 - May, 2022

- Mentored freshmen for their smooth transition to campus life, motivating their academic and co-curricular endeavors.