

# Jitesh Jain

UNDERGRAD RESEARCHER | FOURTH YEAR UNDERGRADUATE | COMPUTER SCIENCE

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*"All progress takes place outside the comfort zone."*

## Education

### Indian Institute of Technology, Roorkee

B.TECH. IN COMPUTER SCIENCE AND ENGINEERING

- CGPA: 8.95/10

Roorkee, India

2019 - Exp. 2023

### Central Academy, Kota

GRADE 12 (SENIOR SECONDARY LEVEL)

- Percentage: 96.60%

Kota, India

2019

### Modern Senior Secondary School, Kota

GRADE 10 (SECONDARY LEVEL)

- CGPA: 10/10

Kota, India

2017

## Experience

### Picsart AI Research

RESEARCH INTERN

- 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.

Remote

June, 2021 - Present

### SHI Lab, University of Oregon

VISITING STUDENT RESEARCHER

- 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.

Remote

November, 2020 - Present

### FilterPixel

ML ENGINEER INTERN

- 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.
- [\[Letter of Recommendation\]](#)

Remote)

July, 2020 - September, 2020

## Publications

### Keys to Better Image Inpainting: Structure and Texture Go Hand in Hand

WACV 2023

JITESH JAIN\* | YUQIAN ZHOU\* | NING YU | HUMPHREY SHI

SHI Lab @ UO

- Proposed an intuitive and effective inpainting architecture that augments the powerful comodulated StyleGAN2 generator with the high receptiveness ability of FFC to achieve equally good performance on both textures and structures.
- Our model achieves remarkable visual quality to match state-of-the-art performance in both structure generation and repeating texture synthesis using a single network.
- [\[PrePrint\]](#) [\[Project Page\]](#)

### SeMask: Semantically Masked Transformers for Semantic Segmentation

arXiv 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

arXiv 2020

AYUSH MANGAL\* | JITESH JAIN\* | KEERAT KAUR GULIANI\* | OMKAR BHALERAO\*

Vision and Language Group, IIT Roorkee

- **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, etc. techniques on the NST task.
- We also proposed the use of pseudo ground truths for evaluating the performance under different settings. [\[GitHub\]](#)

### BackBone Profile

Remote

SHI LAB @ UO

December 2020

- Most of the Segmentation works use networks pretrained on Imagenet as backbones for feature extraction.
- Analyzed backbones like ResNet 18/34/50/101, MobileNetv2, etc. to evaluate their inference time performance metrics. [\[GitHub\]](#)

### Other Significant Projects

SOME OTHER SIGNIFICANT PROJECTS ARE AS FOLLOWS:

- **VQ-VAE Implementation in Pytorch:** Implemented VQ-VAE from scratch in Pytorch on the MNIST dataset as a self-learning project. [\[GitHub\]](#)
- **ChatBot with Pytorch:** Implemented a chatbot in PyTorch using GRUs with an Attention mechanism. [\[GitHub\]](#)

## 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

<b>Programming Languages</b>	Python, Java, Dart, Swift, C, HTML, CSS, JavaScript
<b>Packages and Environments</b>	Pytorch, TensorFlow, Keras, Android Studio, Flutter, Numpy, Pandas, Matplotlib, Scikit-learn, OpenCV, Django
<b>Utilities</b>	Git, Linux Shell, Vim
<b>Relevant Courses (online)</b>	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,
<b>Relevant Courses (offline)</b>	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.