

# Bedant Sharma

3<sup>rd</sup> Year Undergraduate  
Department of Civil Engineering

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## Academic Qualifications

Year	Degree/Certificate	Institute	CPI/%
2021 - Present	B.Tech	Indian Institute of Technology, Kanpur	6.94/10
2021	CBSE(XII)	Mahaveer public school, Jaipur	94.8%
2019	CBSE(X)	Mahaveer public school, Jaipur	91.83%

## Scholastic Achievements

- Cracked All India Rank 6541 in JEE Advanced 2021 out of 150,000 shortlisted candidates.
- Securing a place among the **top 0.9% of the 1.04 million** applicants in JEE Mains 2021.

## Key Projects and Work History

- **Disaster Damage prediction using image segmentation: Summer Intern** under SOCE IIT Kanpur (May- July 2023)
  - Pioneered the implementation of a diverse portfolio of **deep learning** models, including U-Net and LinkNet, by leveraging powerful backbones like ResNet, InceptionV3, ResNeXt, DenseNet, EfficientNet, VGG16, and VGG19. This involved **data mining** and **quantitative analysis** to select the most suitable models for the specific task.
  - Conducted a comprehensive evaluation process involving extensive **data visualization** to compare model performance. This included statistical modeling and clustering and classification techniques to identify patterns and outliers in the data. Through model development and ML algorithms experimentation, we benchmarked various deep learning models to identify the most efficient solution, ensuring optimal utilization of computational resources. This resulted in exceptional results, reaching performance benchmarks (confidential due to NDA).
  - Developed a mastery of image data handling and preprocessing techniques, enabling the efficient conversion of images into one-hot encoded representations for training deep learning neural networks. Additionally, **web scraping** techniques were employed to gather a robust dataset, and strategies like focal loss and random sampling were implemented to effectively address class imbalance issues within the data through quantitative analysis.
- **Multi class classification on MNIST data-set: (Self project)** 🔄 (October-December 2022)
  - Leveraging my strong foundation in Python programming principles, I enthusiastically embarked on a captivating project that encompassed various data science techniques. I actively delved into the world of machine learning with a commitment to excellence, utilizing data visualization for clear and concise communication. I demonstrated strong problem-solving skills by employing predictive analysis and statistical modeling to uncover hidden patterns. Through data mining techniques like clustering and classification, I extracted valuable insights with a keen eye for detail. My project also involved independent initiative in web scraping to gather relevant information and building a machine learning model using MNIST API. This model, a meticulously designed CNN network, incorporated a multifaceted architecture with a convolution layer, a pooling layer, and a strategically positioned dropout layer.
- **Variational Autoencoder (image generation): (Self project)** 🔄 (March 2024)
  - Developed a variational autoencoder (VAE) model using deep learning methods for effective data generation.
  - Utilized an encoder to compress inupt images into a latent space representation capturing essential statistical properties.
  - Implemented the reparameterization to efficiently sample new latent variables, promoting diversity in the generated data.
  - Employed a decoder as a generative model to accurately produce new images resembling images in the given dataset.
  - Optimized model training using the reconstruction loss and KL divergence loss.
  - Applied a mean squared error loss function to ensure that the generated images closely resembled the originals.
  - Demonstrated the significant potential of VAEs in various data analytics tasks, including data augmentation, which is pivotal for enhancing machine learning algorithm performance in clustering, classification, and predictive analysis.

## Technical Skills

- **Programming Languages:** C++, MATLAB, Python, Java, Javascript, C#, R, Curl, Dart, Kotlin, PHP, Golan.
- **Software packages:** Git,Bash, Rstudio, MATLAB,Slack,Microsoft Office Suite, Anaconda navigator, PostMan, PyCharm.
- **Libraries:** numpy, Pandas, scikit-learn,TensorFlow, openCV,segmentation models,Matplotlib, rio, tidyr, reshape2, fevd.

## Relevant Courses

Hydraulic and Hydrologic Design (ongoing)	Communication Skills: Composition	Introduction to Economics
Reinforced Cement Concrete Design	Environmental Quality and Pollution	Design of Steel Structures
Transportation Network Analysis (ongoing)	Partial Differential Equations	Geoinformatics
Advanced Topics in Machine Learning (ongoing)	Fluid Mechanics and Rate Processes	Soil Mechanics
Applied Probability and Statistics	Engineering Graphics	Engineering Hydraulics
Transportation Network Analysis (ongoing)	Computational Methods in Engineering	Supervised Machine Learning*