

# Viral Chitlangia

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## Education

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<b>BS</b>	<b>Indian Institute of Technology Kanpur</b> , Statistics & Data Science	2022 - 2026
	<ul style="list-style-type: none"><li>• <b>CPI</b> : 9.03/10.0</li><li>• Honours Track Student</li><li>• <b>Minor</b> : Dept. of Computer Science &amp; Engineering - Machine Learning &amp; Applications</li></ul>	
<b>XII</b>	<b>Delhi Public School Bangalore East</b>	2022
	<ul style="list-style-type: none"><li>• <b>Grade</b> : 96%</li></ul>	

## Scholastic Achievements

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- **Academic Excellence Award, IIT Kanpur** - For exceptional performance in Academic Session 2022-23.
- Was part of the team that represented **IIT Kanpur** in **Mimamsa 2024** hosted by **IISER Pune**, and secured **4th place** among more than **1500** participating teams.
- Achieved All India Rank **646** in **JEE-ADVANCED 2022**
- Achieved All India Rank **1030** in **JEE-MAINS 2022**

## Publications & Pre Prints

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- Viral Chitlangia, Mosuk Chow, Sharmishta Mitra. "Swap Regression Methodology for Predicting Relationship with Historical Bivariate Data." *arXiv preprint arXiv:2508.15479* [🔗](#), August 2025.

## Manuscripts in Preparation

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- Viral Chitlangia, Suncica Hadzidetic, Miaoja Fu. "Digital interventions for loneliness: Understanding design elements and features from user reviews and discussions on social media" *Manuscript in preparation* for submission to ICT4AWE 2026.

## Projects

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### SWAP Regression | Prof. Sharmishta Mitra | IIT Kanpur

Nov '23 - Aug '25

- Analyzed the paper written by **Mosuk Chow, Bing Li** and **Jackie Q. Xue**, on **ON REGRESSION FOR SAMPLES WITH ALTERNATING PREDICTORS AND ITS APPLICATION TO PSYCHOMETRIC CHARTS** [🔗](#) and developed models with alternating predictors on Bivariate Data using the method of SWAP Regression.
- Defined a new loss function for the **Swap Regression** model.
- Implemented ALT-OPT to solve the loss function.
- Implemented the model to test on real data as **US Public Debt and GDP**.
- Applied the model to predict the causality direction of **US Public Debt and GDP** without prior knowledge.

### Digital Intervention for Loneliness | Prof. Suncica Hadzidetic | Durham University

May '24 - Ongoing

- Explored **Reddit** and **Google** to find relevant subreddits and apps which target **loneliness**.
- Scrapped **Reddit**, **Google Play**, **Apple Play** and **A Lonely Life**(a loneliness forum), using relevant Python libraries, and Rvest(R), to collect text data on **loneliness**.

- Used **Topic Modelling** on the data collected to **cluster** the data into relevant topics, to realise what people are talking about online, to find out which areas of apps people would like to see an improvement in.

#### **Deep Generative Models for Spatial-Temporal Data | Prof. Swapnil Mishra | NUS**

May '25 - Jul '25

- Implementing and analyzing the paper on [AggVAE](#) written by **Swapnil Mishra et al.**
- Working on using the technique to incorporate **AggVAE** with **Population Disaggregation** techniques to get good predictions using Low Resolutions data points.
- Implemented the model on **US Covid Data**, segregated by 9 Regions of the country.

#### **A Review of Enveloping Techniques in Bayesian Statistics | Prof. Dootika Vats | IIT Kanpur**

Aug '25 - Nov '25

- Understood the paper by **Apartim Shukla, Dootika Vats** and **Eric C. Chi** on [MCMC Importance Sampling via Moreau-Yosida Envelopes](#).
- Read about various enveloping techniques in **optimization** and understood the properties of various envelopes, and their usability in MCMC sampling.
- Implemented envelopes, such as Moreau Yoshida and Bregman Moreau Envelopes, for Constraint Distributions.
- Performed Proximal Sampling, using enveloping technique, for distributions with high condition number.

#### **Bayesian Bivariate Load Sharing Model | Prof. Debasis Kundu | IIT Kanpur**

Jan '26 - Ongoing

- Understood and implemented the paper, [A Bivariate Load Sharing Model](#) by Debasis Kundu.
- Incorporating a Bayesian structure to the existing model.
- Exploring posterior inference using MCMC-based methods and Gamma-approximate sampling.

#### **MCMC Machine Unlearning | Course Project | Prof. Dootika Vats | IIT Kanpur**

Jan '25 - Apr '25

- Understood and Implemented the paper on [Markov chain monte carlo-based machine unlearning: Unlearning what needs to be forgotten](#) by QP Nguyen et al.
- Implemented a novel algorithm for the purpose of Machine Unlearning Sampling by MCMC using the idea of **Newton's Method Update** proposed in [Certified data removal from machine learning models](#) by C Guo Et al.
- Compared the algorithm with other prominent MCMC sampling algorithms with **Logistic** and **Negative Binomial** Regression data.

## **Other Experiences**

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#### **Teaching Assistant | MTH 208 | Prof. Dootika Vats | IIT Kanpur**

Aug '24 - Nov'24

- Assisted Professor Dootika Vats in teaching the Undergraduate and Postgraduate students enrolled in MTH 208 the basics of the R language.
- Got a hands on experience of teaching a class of enthusiastic students.

## **Technical Skills**

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**Languages:** Python, R, C, C++,  $\text{\LaTeX}$

**Softwares and Libraries:** Matplotlib, Seaborn, Numpy, Pandas, Tensorflow, Librosa, Numpyro, Rvest, Tidyverse, GG-Plot2, Quarto, Shiny App

## Relevant Courses

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An Introduction to Bayesian Analysis*	Markov Chain Monte Carlo*
Probability Theory	Time Series Analysis
Introduction to Machine Learning*	Probabilistic Machine Learning
Data Structures & Algorithms	Theory of Statistics*
Elementary Stochastic Processes - I*	Elementary Stochastic Processes - II
Linear Regression & ANOVA*	Techniques in AI & Data Mining*
Multivariate Analysis	Analysis-I*

\* : Excellent Performance

## Positions of Responsibilities

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Coordinator, Stamatics Club

Oct '24 - Aug '25

Executive, Stamatics Club

Nov '23 - Oct '24