AYUSH AGARWAL

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EDUCATIONAL AND SCHOLASTIC QUALIFICATIONS

YEAR	DEGREE	INSTITUTE	CPI/%
2017-2021	B.S. Maths & Sci. Computing	Indian Institute of Technology, Kanpur	**8.7**/10

- Secured an All India Rank of **765** in JEE Mains-2017, and an AIR of **3618** in JEE Adv-2017 among 1.2million+ and 220k+ candidates
- Cleared level 1 of the prestigious **National Chemistry Olympiad, IAPT 2017** and stood among the **State Top 1 %** candidates
- Awarded the **Kishore Vaigyanik Protsahan Yojana 2016 Fellowship** under SX division by Indian Institute of Science, Bangalore
- Recipient of notable **INSPIRE** research scholarship offered by Department of Science and Technology, **Government of India**

SUMMER INTERNSHIP

Nomura Structured Finance, Powai *8-week internship in the Macro Structuring Dept* [Apr'20-Jun'20]

- Spearheaded an **Options Open Interest** based systematic trading algorithm for **index trading** in Python; reduced runtime by **60%**
- **Backtested** on several global indices such as **Nifty, Nikkei, Nasdaq** to generate **cumulative returns** of up to **16%** over a **2 year** period
- Built a python based implementation of **Portfolio Allocator and Optimiser** across asset classes, using **Markowitz Efficient Frontier**
- Realized **7%** returns, **4.20** Sharpe in 6 weeks on paper trading of **₹7 Cr.** in a high volatility environment using technical/eco analysis

OPEN SOURCE PRODUCT DEVELOPMENT & PUBLICATION

Google Summer of Code, 2020 *4-month open-source coding program R foundation* [May'20-Aug'20]

Mentors: Dr. Dootika Vats, IIT-Kanpur; Dr. Adam Maidman, Microsoft, Seattle

- Built a novel **R package** for estimating hierarchical **Bayesian quantile regression** model for binary longitudinal data (QBLD)
- Implemented novel Gibbs sampler and random MCMC samplers for **Asymmetric Laplace, Generalized Inverse Gaussian** using **C++**
- Package is **published** with the source code, and made accessible on The Comprehensive R Archive Network **(CRAN)** repository
- ***Citation**: Agarwal, A (2020). qbld: Quantile Regression for Binary Longitudinal Data. R package v1.0.1 IIT, Kanpur. (CRAN)*

SUMMER PROGRAM

Harvard University, Cambridge, USA *8-week on campus summer residency program* [Jun'19-Aug'19]

Quantitative methods in Data Science *Instructor : Prof. Michael Parzen, Department of Statistics, Harvard University*

- Developed skills in Data **Exploratory Analysis, Visualisation, Plotting, Cleaning** using developmental tools such as R/R studio
- Learned techniques in **Hypothesis testing, statistical inference, regression modelling** on real world datasets using R/R studio

Financial and Managerial Economics *Instructor : Prof. James Owers, Department of Finance, Harvard Extension School*

- Learned notions of Financial institutions, Time value**,** Risk analysis**, Capital budgeting, Mergers,** Dividends, **Restructuring**
- Analysed **valuation of assets & securities**, Cash flows, Income statements and Balance sheets of top valued companies using Excel

PROJECTS AND TEACHING ASSISTANT

* Ongoing

Undergraduate Tutor, Department of Mathematics, IIT-Kanpur* (Prof. Dootika Vats, Mathematics, IIT Kanpur)

- Undergraduate Tutor for a **Postgraduate level statistics** course, MTH511A:Statistical Simulation and Data Analysis
- Responsible for setting and grading the quizzes, mid-sem and end-sem exams; engaging on forums for doubt clearing

To Bayes or Not to Bayes (ACA, Dept of Computer Science, IIT-Kanpur)

- **Mentoring and tutoring** 6 freshmen in **Bayesian Computational** field under the certification of ACA, IIT-Kanpur
- **Implementation** and analysis of **Regression models, Markov Chains, Probabilistic Machine Learning** Algorithms

SARIMA Time Series Analysis (Prof. Amit Mitra, Mathematics, IIT Kanpur)

- Implemented a **SARIMA time series model** in python for Monthly Rainfall Data of the last 114 years in India
- Used **PACF Interpolation** techniques, Dickey-Fuller Test, **Box-Jenkins** Algorithm to achieve predictive forecasting

Undergraduate Research Project, Change Point Analysis* (Prof. Dootika Vats, Mathematics, IIT Kanpur)

- Authoring a **publicable research paper** on "Change-point Analysis in Markov Chains" using CUSUM, and Kolmogorov statistics

POSITIONS OF RESPONSIBILITY

Editor, Vox Populi, IIT Kanpur- Print, Video and Data Journalism [Apr'19-Apr'20]

- **Headed** the **Campus Connect** division to publish pieces that cover pertinent issues **through print, vocal and digital media**
- Conducted **coverage of flood affected areas** in collaboration with the "**Unnat Bharat Abhiyan**" mission by visiting the affected areas

Head, Stamatics, Department of Mathematics, IIT-Kanpur [Jan'20-Aug'20]

- **Headed** the Mathematics and Statistics society of IIT Kanpur, under the aegis of the **Department of Mathematics**
- **Conducted** Mathemania, a math based puzzle and logical problem solving marathon for both UG & PG students

Editorial Executive, Science and Technology Council, IIT-Kanpur [Aug'18-Mar'19]

- **Lead** the SnT Council team for developing **marketing brochures for sponsorship, term reports, editing the newsletter**

IMPORTANT COURSEWORK AND TECHNICAL SKILLS

- **Coursework:** Data Structures and Algorithms| Markov Chain Monte Carlo| Time series Analysis| Statistical Simulation and Data Analysis| Stochastic Processes|Probability & Statistics| Bayesian Econometrics| Exploratory Analysis | Regression Models| Set Theory & Logic| Linear & Abstract Algebra| Human Cognitive Processes| Differential Equations
- **Languages & Tools**: C/C++, Python, Julia*, R/R Studio, RCpp, Markdown, LATEX, Django, HTML5, SQL*, Git
- **Libraries**: tidyverse, ggplot2, keras, tensorFlow, pandas, matplotlib, numpy, scipy, scikit-learn, beautifulsoup4,qbld