

Pranav Rai

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RESEARCH INTERESTS	My general interests are to understand how specific neural architectures lead to particular behaviors. And using computational modeling to understand how is information processed in these circuits . <i>Keywords</i> : Neuroscience, Cognitive Science, Computation Modeling, Machine Learning	
EDUCATION	Indian Institute of Technology Kanpur (IIT Kanpur) <ul style="list-style-type: none">Master of Science (by Research), Cognitive Science <i>July 2019 - Present</i> CPI - 10/10Bachelor of Technology, Aerospace Engineering <i>July 2012 - July 2016</i> CPI - 7.8/10 Shiwalik Public School , Ropar <ul style="list-style-type: none">Higher Secondary Certificate, CBSE (Performance - 92.4 %) <i>2012</i>Secondary Certificate, CBSE (Performance - 9.6/10) <i>2010</i>	
SCHOLASTIC ACHIEVEMENTS	<ul style="list-style-type: none">Currently Ranked 1st across the department in the postgraduate program.Secured All India Rank 1 in COGJET 2019 (Entrance test for Cognitive Science Admission Programs)Recipient of Certificate of Merit for Academic Excellence awarded by IIT Kanpur for the academic year 2019-20.Recipient of the prestigious Mahajan Trust Scholarship for being among the toppers in district in 12th Board Examinations.Secured an International Rank of 36 (State Rank 3) in International Mathematics Olympiad conducted by Science Olympiad Foundation.	
RESEARCH EXPERIENCE	Lab of Neural Systems, IITK MS Thesis Project : Understanding Information Processing during Olfaction <i>Mentored by Dr. Nitin Gupta</i> <i>July,2019 - Present</i> <ul style="list-style-type: none">The objective of the project is to understand the effect of Mushroom body's neural architecture on the information content of Mushroom Body Output Neurons.I model the neural architecture and its information processing in MATLAB and through simulations try to understand similarity of information content at various stages.I also use the hemi-brain connectome data in my model to see what kind of connectivity biases exists in the real data. Defence Research and Development Organisation , Bengaluru Estimation of Pressure Variation through a Scoop Duct installed on an Aircraft <i>Mentored by B Sreenath Bhat</i> <i>June - July 2014</i> <ul style="list-style-type: none">Developed a procedure to determine pressure variations in scoop duct using Thermodynamics and incorporating Boundary Layer, Negative C_p Effects.Runge Kutta method was used to solve the differential equations obtained by using basic principles of compressible aerodynamics.A tool was made using Visual Basic which could plot the graph of Exit Pressure through scoop Vs Mass flow rate at a specified altitude.	

PROFESSIONAL EXPERIENCE

Consultant, EXL Analytics , Gurgaon

September 2016-July 2019

I primarily worked as a Data Science Consultant for a Fortune 100 Financial Company and an Indian Media Network. I also developed the client's team capabilities by training them in programming and using ETL functionalities of the data extraction system.

- **Ad Schedule Optimization** - The aim was to design an ad scheduling framework for a TV Channel that maximizes retention during advertisements while maintaining the program viewership—historical broadcast and viewership data for different TV shows. We developed regression models to determine the impact of scheduling parameters, content characteristics on ad-break retention, and program viewership. Finally, we used linear programming for optimization of regression equation of ad-break retention subject to the regulatory constraints.
- **Risk Scorecard Model Creation** - I modelled Approve/Decline decision for small business loans to merchants based on the risk assessment using their Application information data and Consumer/Commercial Bureau reports. I developed a dependent variable for the whole application base using the actual default for funded contracts and by developing a lookalike model using GBM for non-funded applications predicting the default based on FICO, Default on Bureau, Drop in Dollar Transactions etc.
- **Loan Amount Optimization** - The objective was to optimize loan amount by funding more to lower risk segments and less to higher risk segments. I proposed using Total Network Receivables as leverage instead of Single network receivables to ensure higher funding. It led to increased loan amount in certain segment by up to **2.5x** by leveraging Total network receivables to ensure no incremental risk. The impact was that we increased annual funding by **27%** without increasing default rates.

TEACHING EXPERIENCE

Bayesian Models and Data Analysis (Teaching Assistant)

January 2021- Present

Basic Statistics, Data Analysis, Inference (Teaching Assistant)

August- December 2020

Was responsible for teaching, clearing doubts, preparing and grading questions as well as smoothly conducting the course especially given that we had to transition in an online mode due to the COVID -19 pandemic.

SKILLS

- **Computational Tools:** MATLAB , SAS, L^AT_EX
- **Programming Languages:** C, C++ , Python, R, HTML, Basic Shell Scripting
- **Natural Languages:** Hindi (native), English (proficient), Punjabi (proficient) , German (Pursuing A2 level)

POSITIONS OF RESPONSIBILITY

- **Student Nominee, Academic Senate and Senate Post Graduate Committee** - I work as a link between the student body and highest decision making body of the institute. Recommended various policy changes to be considered in the face of COVID-19. (2019-Present)
- **Senator, Students Senate** - I work as a link between my batch and the highest Student body of the institute. I raise concerns on the behalf of my batch to the Students Senate and part of many decisions on student governance. (2020 -Present)

RELEVANT COURSEWORK

Neurobiology, Foundations of Cognitive Science, Data Structures and Algorithms, Basic Statistics, Data Analysis and Inference, Linear Algebra, Partial Differential Equations, Bilingualism

EXTRA CURRICULAR ACTIVITIES

- **Adventure Sports** - Active Member of Institute's Adventure Club. I have successfully completed 4 moderate to difficult treks in Himalayan Ranges. Involved in running and physical training camps of the club.
- **Quizzing** - Active member of Quiz Club, IIT Kanpur. I have secured top 3 positions in multiple quizzes held at the institute and national level.