

ARCCHIT JAIN

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EDUCATION

2015	Integrated M. Sc., Mathematics and Scientific Computing, Indian Institute of Technology Kanpur, India	CGPA: 8.0/10.0
2010	Class 12, Central Board of Secondary Education (CBSE)	93.6%
2008	Class 10, Central Board of Secondary Education (CBSE)	95.6%

RESEARCH INTERESTS

Data Science | Machine Learning | Decision Trees | Statistical Simulation | Image Processing

ETS SCORES

2016	Graduate Record Exam (GRE) 322/340		Quantitative Reasoning 170/170		Verbal Reasoning 152/170
2016	TOEFL - Internet Based Test 105/120		Reading 28/30, Listening 26/30, Speaking 23/30, Writing 28/30		

ACADEMIC ACHIEVEMENTS

2016	Certified by Institute of Actuaries of India for 'Financial Mathematics' and 'Probability and Statistics'
2012	Received fellowship by Summer Research Fellowship Programme by Indian Academy of Science
2010	Fellow of Kishore Vaigyanik Protsahan Yojana (KVPY) , awarded to top 125 aspiring scientists across India by Department of Science and Technology (DST) and Indian Institute of Science (IISc), Bangalore
2010	Attained 99.4 Percentile (among 472,000) in Joint Entrance Examination for admission into IIT
2010	Secured All India Rank of 535 (among 1.1 million) in All India Engineering Entrance Examination
2009	Placed among State-wise Top 1 Percentile in National Science Examination in Physics
2008	Awarded Merit of 0.1 percentile from CBSE Board for scoring 100% marks in French in Class 10

EMPLOYMENT EXPERIENCE

Credit Risk Analyst, Risk and Information Management, American Express, Gurgaon	Jul'15 - Present
-	Developed Gradient Boosting Machine based Credit Risk Models for 22 countries with impact of \$ 7M
-	Responsible for quarterly tracking of models for EMEA and weekly tracking of 243 modeling variables
-	Pioneered automated defaulter tool that queries data from Teradata, scores model to generate Excels
-	Working on credit bureau data of Canada to enhance payment information in 37 variables on SAS

CONFERENCES

2015	Selected among top 50 students from India to Summer School on Applied Mathematics organized by Indo-French Centre for Applied Mathematics at Indian Institute of Science (IISc), Bangalore, India
2015	Selected by Head of Department, Department of Mathematics and Statistics, IIT Kanpur to attend 2nd IKDD Conference on Data Science organized by ACM SIGKDD in Bangalore, India
2015	Selected among 450 students for Harvard US India Initiative (HUII) Conference on Developmental Initiatives
2010	Attended Vijyoshi Camp by KVPY program, Department of Science and Technology at IISc, Bangalore

TECHNICAL SKILLS

SAS, SQL, MATLAB, R, Mathematica, C, MS-Excel, Linux, \LaTeX and Beamer

Image Compression and Denoising using Wavelets and Fractal Interpolation Functions Aug14-Apr15

Prof. G.P. Kapoor, Mathematics | Prof. Sumana Gupta, Electrical Engineering, IITK MATLAB, Mathematica

- Implemented Image Compression by Daubechies (DB_4) Wavelets and achieved **compression ratio of 3.4**
- Implemented **Image Denoising** using thresholding by Visu Shrink, Otsu's Method with DB_4 Wavelets
- Computed FIF's to denoise images and compared results against wavelets to model images
- MSc Report: [Download](#), Presentation: [Download](#)

SUMMER INTERNSHIPS

Identification of Thin File Customers and Enhancement of Credit Risk Models May-Jul 2014

Risk and Information Management, American Express, Gurgaon, India SAS

- Identified thin file customers: Card-members with little credit bureau activity for Canada, UK, Mexico, Italy
- Calculated Gini values for thin file segments to check for value addition of this information in risk models
- Improved existing thin file definitions and increased discrimination in credit bureau score among thin files
- **Improvise the accuracy** and Gini score of internal credit risk models from 95% to 96% using SAS
- **Achievement:** Found under-prediction of default probability in current risk models for thin file customers
- Received and accepted **Pre-Placement Offer** as Business Analyst at cost-to-company of INR 1.36 Million

X-Ray focal spot deblurring using Coded Aperture Imaging May-Jul 2013

Research and Development Division, Siemens, Bangalore, India MATLAB

- Created a framework in MATLAB to model blurring due to extended focal spot in X-Ray machines
- Obtained Point Spread Function to get **Angular Blur Matrix** for any general configuration of X-Ray machine like shape, size and orientation of coded source, size of detector and position of object
- Plotted Isobluor Contours by calculating pixel shifts and reconstructed 3D spatial orientation by its depth map
- Constructed **Angular Blur Matrix** for any configuration of the source and simulated deblurring
- **Achievement:** Increased life of X-Ray Tube by 5 years by increasing focal spot area on anode

Study of Fields and Galois Theory May-Jul 2012

Mentor: Prof. Sudesh K. Khanduja, Indian Institute of Science, Education and Research, Mohali, India L^AT_EX

- Studied Vector Spaces, Field Extensions, Splitting Fields, Simple, Separable and Normal Extensions
- Researched on Perfect Fields, Finite Fields, Galois Extensions and Fundamental Theorem of Galois Theory
- Report: [Download](#)

ACADEMIC PROJECTS

Sentiment Analysis of Movie Reviews Apr 2015

Mentor: Prof. Amit Mitra, Statistics, IIT Kanpur Python

- Cleaned data of 25000 IMDB movie reviews from Kaggle using Python Libraries like BeautifulSoup and NLTK
- Identified feature words using Bag of Words, Word2Vec and classified each word to a fractional sentiment value
- Explored ML Techniques like Support Vector Machines, k-Nearest Neighbour and Artificial Neural Networks
- Achieved maximum accuracy of 84.35% with Random Forest with 100 trees
- Report: [Download](#)

Graph Theoretic Analysis of Game of Sprouts Apr 2015

Mentor: Prof. Arbind K. Lal, Mathematics, IIT Kanpur Beamer

- Devised winning strategies and calculated bounds on number of moves for Game of Sprouts
- Calculated exact number of moves for '**Brussels Sprouts**' using Euler characteristic of planar graphs
- Proved that determining number of moves of a general position of Game of Sprouts is **NP-complete** Problem
- Abstract: [Download](#), Presentation: [Download](#)

Generalized Equalization Model for Image Enhancement	Oct 2014
Mentor: Prof. Sumana Gupta , Electrical Engineering, IIT Kanpur	MATLAB
<ul style="list-style-type: none"> - Implemented White Balancing and Contrast Enhancement using Histogram Equalization technique - Studied a generalized equalization model and estimated parameters to balance linearity of histogram transform - Report: Download 	
Multiple Linear Regression Model using Bootstrap and Jackknife	Jan-Apr 2014
Mentor: Prof. Subhra Sankar Dhar , Statistics, IIT Kanpur	R
<ul style="list-style-type: none"> - Compared resampling techniques to estimate distribution of regression parameters across different sample sizes - Estimated regression coefficients by multiple linear regression on population size of 100 and 3 variables - Simulated 1000 bootstrap samples of size 100 each and created 100 samples of 1-delete jackknife - Concluded that bootstrapping is reliable if number of samples are significantly greater than population size - Established that jackknife technique gives minimum standard errors if population size is more than 50 - Report: Download 	
Panel Data Analysis	Jan-Apr 2014
Mentor: Prof. Sharmistha Mitra , Statistics, IIT Kanpur	R
<ul style="list-style-type: none"> - Collected panel data on real life agricultural information of 6 countries from World Bank Databank - Calculated Pooled Ordinary Least Square, Fixed Effects or Within and Random Effects Estimators - Removed multicollinearity from panel data by calculating Variance Inflation Factors - Conducted Lagrange Multiplier Test and Hausman Test and concluded that fixed effects model should be used - Estimated correlation of agriculture-based variables with nation's GDP using accepted fixed effects model - Report: Download 	
Time Series Analysis of Kanpur's Temperature using Box-Jenkins Method	Aug-Nov 2013
Mentor: Prof. Amit Mitra , Statistics, IIT Kanpur	R
<ul style="list-style-type: none"> - Fitted S-ARIMA model on 50 years' monthly temperature series and estimated parameters by residual plots - Accurately forecasted temperatures of 12 months using Box Jenkins Method with mean error under 0.5⁰C - Report: Download 	
Applications of Wavelets for Computer Graphics	Jul-Dec 2013
Mentor: Prof. P. Shunmugaraj , Mathematics, IIT Kanpur	MATLAB
<ul style="list-style-type: none"> - Implemented Image Compression on MATLAB using 2-D Haar Wavelet Transformation - Studied de Castlejau's algorithm and Chaikin's corner cutting algorithm for subdivision of images - Report: Download 	
Fundamentals of Undecidability in Computational Theory	Aug-Nov 2012
Mentor: Prof. Akash Anand , Mathematics, IIT Kanpur	L ^A T _E X
<ul style="list-style-type: none"> - Proved Undecidability of Halting Problem, Hilbert's Tenth Problem and Matrix Mortality Problem - Studied Gödel's Incompleteness Theorem, Church - Turing Hypothesis, Post Correspondence Problem - Report: Download 	
Interpreter in Oz Programming Language	Aug-Nov 2012
Mentor: Prof. Satyadev Nandakumar , Computer Science, IIT Kanpur	Oz
<ul style="list-style-type: none"> - Developed afresh an interpreter in Oz Programming Language - Implemented advanced aspects like error handling, function calling and trigger creation, in the design 	
Law against Sex Determination and its Consequences	Sep-Nov 2012
Mentor: Prof. P. M. Prasad , Economics, IIT Kanpur	L ^A T _E X
<ul style="list-style-type: none"> - Analyzed effects of Pre-Conception & Pre-Natal Diagnostic Techniques Act on doctor-patient relationships - Presented report in an effort to understand the economic reasons behind declining child sex ratios in India - Report: Download 	

RELEVANT COURSES

Statistical and AI Techniques in Data Mining	Applied Stochastic Processes	Data Structures and Algorithms
Statistical Simulation and Data Analysis	Probability and Statistics	Numerical Computation
Time Series Analysis	Differential Equations	Theory of Computation
Principles of Programming Languages	Regression Analysis	Image Processing
Foundations of Mathematical Finance	Discrete Mathematics	Probability Theory
Linear Programming and Optimization	Linear Algebra	Graph Theory

POSITIONS OF RESPONSIBILITY

Department Placement Coordinator, Students' Placement Office, IIT Kanpur Apr'14 - Dec'14

- Responsible for placement of 42 students from Department of Mathematics and Statistics within 1st week
- Created departmental brochure and invited 72 companies of Analytics, Finance and Programming profiles
- Organized Pre Placement Talk of J P Morgan - Chase and conducted online test for EXL
- Selected as a Single Point of Contact for Goldman Sachs and Accenture during interviews

Head, Events, Techkriti - Annual Technical and Entrepreneurial Festival, IIT Kanpur Sep'13 - Mar'14

- Directed a 4-tier team of more than 200 members to accentuate the festival with budget of INR 13 Million
- Conducted 52 national and 7 international competitions and managed total prizes of INR 2.5 Million
- Accounted for registration, accommodation and security of more than 1400 participants during festival
- Initiated Social Campaigns: Relief for Uttarakhand, Women Empowerment Drive, Blood Donation Camps
- Collaborated for the first time with **UNESCO** to promote the social initiatives of Techkriti

Coordinator, 28 States - Flagship Social Initiative Event, Techkriti, IIT Kanpur Nov'12 - Mar'13

- Spearheaded a 3 tier team of 12 members to conduct a 4 round event aimed at highlighting social issues
- Envisioned, pioneered and conceptualized its structure and associated with 13 NGOs and Media Houses
- Publicized extensively and ensured participation of over 750 students and 300 essay submissions

Student Guide, Counselling Service, IIT Kanpur Jul'11 - Apr'12

- Mentored 6 freshmen for their 1st year and assisted them in getting acclimatized to campus environment
- Monitored the orientation process of the undergraduate freshmen batch of 2011 consisting of 827 students

Coordinator, IDEAS - Flagship Business Plan Competition, Techkriti, IIT Kanpur Aug'11 - Feb'12

- Conducted India's one of the largest Business-Plan competition in 4 rounds with a budget of INR 300,000
- Directed a 3 tier team of 13 members and systematized more than 100 entries worldwide
- Pioneered 2 webinars and provided mentoring for participants by Indian Angels Network

EXTRA CURRICULAR ACHIEVEMENTS

2013	Selected among top 30 out-of 500 teams in Manthan, India's largest youth movement, for analyzing solutions for Universalising Access to Quality Primary Healthcare in India
2013	Stood 2 nd in Siemens Intern Tech Challenge for designing SMART food adulteration kit
2012	Voted 2 nd most popular app for a price comparison web app in Yahoo! - Hack U at IIT Kanpur
2011	Awarded Silver Medal in Water Polo in the Inter-IIT Aquatics Meet, representing IIT Kanpur
09-10	Acknowledged in succession as Quizzer of the Year at India International School, Jaipur, India
2009	Adjudged as Singer of the Year at India International School, Jaipur, India
07-08	Stood 2 nd and 3 rd respectively at Rajasthan State Open Chess Championship in U-15 and U-19
04-05	Represented school at West Zone Chess Tournament in U-14 and U-19 held by CBSE at Gwalior, India
2003	Ranked 2 nd at Jaipur Open (U-10) Chess Championship held by Jaipur District Chess Association