Tushant Mittal | Resume

✉ tushant@iitk.ac.in • home.iitk.ac.in/~tushant

Education

B.Tech., Computer Science And Engineering **9.1/10.0**
IIT Kanpur *(Expected) 2018*

Class XII, Board of Intermediate Education **96.9%**
FIITJEE,Hyderabad *2014*

Class X ,Central Board of Secondary Education **10.0/10.0**
Bharatiya Vidya Bhavan's Public School, Hyderabad *2012*

Research Interests

·Algebraic Algorithms ·Cryptography ·Computational Number Theory ·Algebraic Geometry

Research Experience

Algebraic Geometry: `home.iitk.ac.in/~tushant/projects/grassmanians.pdf` *May-July 2016*

- Summer Internship under **Prof.Kapil Hari Paranjape**, IISERM funded by the Indian Academy of Sciences as part of the **Summer Research Fellowship Programme**
- Learned **Commutative Algebra** and explored different aspects of Algebraic Geometry such as Computational, Classical and Enumerative Algebraic Geometry
- Covered the basics of Algebraic Geometry and also learnt about **Gröbner basis**, Schläfli's Double Six.
- Found an elementary proof of the **Grassmannian** as a Projective Variety using only ideas from linear algebra and algebraic geometry which is a much more accessible proof than the traditional one which uses exterior algebra.

Projects

NachOS: *Aug - Nov 2016*

- Course project for CS330- Operating Systems under **Prof. Mainak Chaudhuri**
- Implemented System calls pertaining to Fork, Exec, Join, Sleep and Exit
- Implemented UNIX, First in First Out, Round Robin and Shortest Job First job scheduling algorithms
- Implemented Shared Memory, Semaphores, Condition variables and Demand Paging

Machine Learning: `github.com/mittaltushant/stanford-ml` *Jan - Apr 2015*

- Semester project under the Association for Computing Activities (**ACA**), IITK
- Project goal was to learn the basics of Machine Learning and its techniques
- Implemented various popular ML algorithms like **Least Square Method, Logistic Regression, Weighted Linear Regression, Naive Bayes**(for e-mail spam detection) and **K-Means Clustering** (for Image Compression) in Python

Information Theory: `home.iitk.ac.in/~tushant/projects/info.pdf` *Aug - Nov 2015*

- Course project for CS201- Discrete Mathematics under **Prof. Rajat Mittal**
- Introduced to the fundamentals of Information Theory starting from the definition of entropy, prefix coding including concepts like **Kraft's Inequality**, Binary Symmetric Channels upto **Shannon's Theorems**
- Prepared a project report and gave a project presentation on the topics covered

Foosball: *Aug - Nov 2015*

- Course project for TA201A - Manufacturing Processes under **Prof. Anish Upadhayaya**
- Made a miniature version of the popular Foosball game table using metal sheets and manufacturing processes such as **welding, brazing, sheet metal forming, casting**
- Implemented folding mechanism to make the table portable and were awarded the prize of $\mathbf{3^{rd}}$ best project

Academic Achievements

SRPF 2016: Selected by the **Indian Academy of Sciences** for their coveted Summer Research Fellowship Programme - 2016 to conduct research at Indian Institute of Science Education and Research

JEE 2014: Secured All India Rank **186** in **JEE Advanced 2014** (out of 1,50,000 participants)

KVPY 2014: Selected for the Prestigious **Kishore Vaigyanik Protsahan Yojana** National Fellowship Program funded by the Department of Science and Technology, Government of India

NSEP 2014: Among top **10%** in National Standard Examination in Physics conducted by IAPT

2012: Awarded **K.M.Munshi Award** for Maths and Certificate of Commendation by Shikshan Bharti for securing CGPA 10.0 in AISSC conducted by CBSE in 2011-12

Informatics 2011: Secured State Rank **2** and International Rank **231** in **International Informatics Olympiad** (iiO) organized by Computer Literacy Foundation

Technical skills

Programming: C, Python, Octave, Bash, Verilog

Web-Dev: HTML, CSS, PHP, SQL, Django

Tools: LaTeX, GNUPlot, Git, SQLite

Relevant Courses

- •Computational Number Theory and Algebra‡
- •Modern Cryptology‡
- •Randomized Algorithms‡
- •Elliptic Curves and Applications
- •Theory of Computation*
- •Algorithms -II
- •Data Structures and Algorithms*
- •Operating Systems
- •Compiler Design‡
- •Computing Laboratory-I
- •Computing Laboratory - II
- •Computer Organization
- •Fundamentals of Computing
- •Discrete Mathematics
- •Mathematical Logic
- •Abstract Algebra
- •Probability and Statistics*
- •Calculus
- •Linear Algebra and DE

* - A* grade in these subjects. Awarded to top 1-2% students
‡- Ongoing Courses

Extra Curriculars

Quizzing

- An avid quizzer, I have participated and won at many intra-college quizzes and inter-school competitions.
- Selected the Contignent leader of the IITK team for Nihilanth'16 held at IIM Indore
- Was the **quizmaster** for Takneek'15 Sci-Tech Quiz
- Managed the Quiz Club, IITK's affairs as the Secretary in 2015-16 and am currently its **Co-ordinator**

Science Coffeehouse

- I also have an interest in giving/listening to science talks and won the **second prize** in the Takneek'15 SciTalk Competition.
- Chosen as the **Leader**,Science Coffeehouse,IITK a hobby group where discussions and talks are held on a wide number of scientific topics, for the current academic year 2016-17