Farhan Ali
Curriculum Vitae

Delhi Okhla Industrial Estate, Phase III
New Delhi
India
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Education

2021–2025   **Bachelor of Technology in Computer Science and Engineering**,
Indraprastha Institute of Information Technology Delhi, New Delhi, India,
Cumulative GPA: 9.3/10

Research Experience

Theoretical Computer Science

May–July 2023   **Separation Problems in Special Graph Classes**,
Summer Undergraduate Research Fellow (SURF) 2023, IIIT Delhi, India,
Advisor: Dr. Diptapriyo Majumdar (IIIT Delhi)

Worked on trying to find parameterized algorithms faster than $\mathcal{O}(2^k poly(n))$ and polynomial kernels of size smaller than $\mathcal{O}(k^3 l^7)$ for different variants of MULTICUT in interval and proper interval graphs.

○ Found specific results for the UNRESTRICTED MULTICUT variation

Combinatorics

June–August 2023   **Covering Grids with Hyperplanes**,
Polymath Jr 2023 Research Program, *(online)*,
Advisors: Dr. Anurag Bishnoi (TU Delft), Dr. Aditya Potukuchi (York University),
Daniel Hathcock (CMU), Kevin Pratt (CMU)

Worked along with 20-30 people on trying to improve known bounds on the true asymptotic value of $\text{cov}_k(\Gamma_n)$, study the k-covering problem over fields other than $\mathbb{R}$, extend known results for $\mathbb{R}^2$ to higher dimensions and determine a closer threshold for the Ball-Serra bound to be tight

Awards

○ Dean's Award (2021-2022 and 2022-2023)
Awarded for academic excellent academic performance
(At least 9/10 GPA in both semesters of an academic year)

Undergraduate Coursework

Reading Groups and Courses (IIIT Delhi)

Spectral Graph Theory Reading Group   *Attendee and Presenter*
(Organizer: Dr. Manuj Mukherjee)   *Summer Semester, 2023*

Undergraduate Courses (IIIT Delhi)

CSE322	Theory of Computation	A+
	(Instructor: Dr. Syamantak Das)	*Winter Semester, 2023*
CSE112	Computer Organization	A+
	(Instructor: Dr. Sujay Deb)	*Winter Semester, 2022*
CSE101	Introduction to Programming	A+
	(Instructor: Dr. Pankaj Jalote)	*Monsoon Semester, 2021*
MTH240	Real Analysis-I	A+
	(Instructor: Dr. Debika Banerjee)	*Monsoon Semester, 2022*
MTH212	Abstract Algebra-I	A+
	(Instructor: Dr. Krishanu Roy)	*Winter Semester, 2023*
MTH211	Number Theory	A+
	(Instructor: Dr. Sneha Chaubey)	*Monsoon Semester, 2022*
MTH201	Probability and Statistics	A+
	(Instructor: Dr. Acushla Saraswat)	*Winter Semester, 2022*
CSE231	Operating Systems	A
	(Instructor: Dr. Arani Bhattacharya)	*Monsoon Semester, 2022*
CSE222	Algorithm Design and Analysis	A
	(Instructor: Dr. Diptapriyo Majumdar)	*Winter Semester, 2023*
MTH204	Differential Equations	A
	(Instructor: Dr. Sneha Chaubey)	*Winter Semester, 2023*
MTH100	Linear Algebra	A
	(Instructor: Dr. Acushla Saraswat)	*Monsoon Semester, 2021*
CSE121	Discrete Mathematics	A-
	(Instructor: Dr. Bapi Chatterjee)	*Monsoon Semester, 2022*
ECE113	Basic Electronics	A-
	(Instructor: Dr. Sudhanshu Shekhar Jamuar)	*Winter Semester, 2022*
ECE111	Digital Circuits	A-
	(Instructor: Dr. Viswes Visweswaran)	*Monsoon Semester, 2021*
DES102	Introduction to HCI	A-
	(Instructor: Dr. Indrani De Parker)	*Monsoon Semester, 2021*
SSH215	Nation and her Narratives	A-
	(Instructor: Dr. Payel C Mukherjee)	*Winter Semester, 2022*
CSE201	Advanced Programming	B
	(Instructor: Dr. V. Raghava Mutharaju)	*Monsoon Semester, 2022*
CSE102	Data Structures & Algorithms	B
	(Instructor: Dr. Piyus Kedia & Dr. Bijendra Nath Jain)	*Winter Semester, 2022*
COM101	Communication Skills	B
	(Instructor: Dr. Payel C Mukherjee)	*Monsoon Semester, 2021*

CSE202	Fundamentals of Database Management System	*B-*
	(Instructor: Dr. Vikram Goyal)	*Winter Semester, 2023*
MTH210	Discrete Structures	*Audit*
	(Instructor: Dr. Samaresh Chatterji)	*Monsoon Semester, 2022*
BIO221	Practical Bioinformatics	*Audit*
	(Instructor: Dr. Tavpritesh Sethi)	*Winter Semester, 2023*

Undergraduate Projects

1) **Linklearn Prototype**, *(Course Project for Introduction to HCI)*,
Presentation Link

2) **Pokémon Battle Calculator**, *(Course Project for Introduction to Programming)*,
Github Repository Link

3) **Tower Defense**, *(Course Project for Introduction to Programming)*,
Github Repository Link

4) **Custom ISA Assembler and Simulator**, *(Course Project for Computer Organization)*,
Github Repository Link

5) **Finding a Home After Exile**, *(Course Project for Nation and her Narratives)*,
Presentation Link

6) **Unlearning & Transition of Identity**, *(Course Project for Nation and her Narratives)*,
Presentation Link

7) **Tank Stars**, *(Course Project for Advanced Programming)*,
Github Repository Link

8) **AMUL Database Management System**, *(Course Project for Fundamentals of Database Management System)*,
Github Repository Link

9) **Effect of Vitamin D on auto-immune diseases**, *(Course Project for Practical Bioinformatics)*,
Presentation Link

Technical Skills

| Languages | Python, C, C++, Java, Bash, Assembly, Haskell, Javascript, HTML, CSS, Matlab, GNU Octave, LaTeX, Beamer, SageMath |
| Technologies | Linux, Git, Figma, Numpy, Pandas |

Co-curriculars

Club Involvement

| 2022–2025 | **Club Head of Évariste**, *Mathematics and Theoretical CS Club at IIIT Delhi* |
| 2022–2025 | **Member of LDA**, *Literature, Debate and Anime Club at IIIT Delhi* |