CV (Nitin Saxena)

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Personal Information

Name: Nitin SAXENA
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E-address: nitin@cse.iitk.ac.in ; https://www.cse.iitk.ac.in/users/nitin/

Date and place of birth: 3rd MAY 1981, Prayagraj, India
Nationality: INDIA **Gender:** M

S No	Degree	Subject	Year	University	Additional Particulars
1	**B.Tech.**	Computer Science & Engineering, Algebra, Number theory	2002	Indian Institute of Technology Kanpur	Thesis: *Towards a deterministic polynomial-time primality test* (Won the best BTech CSE Project Award 2002)
2	**Ph.D.**	Computer Science & Engineering, Algebra, Number theory	2006	Indian Institute of Technology Kanpur	Thesis: *Morphisms of Rings and Applications to Complexity* (Won Outstanding PhD Student Award of IBM India Research Lab 2005) Guide: Manindra

					Agrawal
3	**Post-Doc Research**	Mathematics, Informatics, Quantum complexity	2006-08	CWI (*Centrum voor Wiskunde en Informatica*) Amsterdam, Netherlands	Host: Prof.dr.Harry Buhrman

Positions held (in chronological order):

S No	Period	Place of Employment	Designation
1.	May'25-	Wadhwani School of AI & Intelligent Systems, **IIT Kanpur**	Dean
2.	May'19-	CSE, **IIT Kanpur**	N. Rama Rao Chair Professor
3.	Nov'18-	CSE, **IIT Kanpur**	Professor
4.	Apr'13-Oct'18	CSE, **IIT Kanpur**	Associate Professor
5.	Aug'18-'24	**Chennai Mathematical Institute**, H1, SIPCOT IT Park, Chennai.	Adjunct Professor
6.	Dec'14	**UPMC Paris-6**, France	Visiting Professor
7.	Apr'08-Mar'13	**Hausdorff Center for Mathematics**, University of Bonn, Germany	Professor W2, BonnJuniorFellow
8.	Sep'06-Mar'08	**CWI Amsterdam**, The Netherlands	Scientific Researcher
9.	Sep'04-Jun'05	CS, **National University of Singapore**	Visiting Scholar
10.	Sep'03-Aug'04	CS, **Princeton University**, USA	Visiting Student Research Collaborator
11.	Jul'02-Jul'06	CSE, **IIT Kanpur**	Infosys PhD Fellow

Selected Publications (top 10)

All reprints are available at https://www.cse.iitk.ac.in/users/nitin/research.html .

S.No.	Authors (in alphabetical order)	Title	Venue (peer-reviewed)
1.	Pranjal Dutta, Nitin Saxena, Amit Sinhababu,	Discovering the roots: Uniform closure results for algebraic classes under factoring	Journal of the ACM, vol.69:3, 18:1-39, June 2022. *[first version in STOC'18]*
2.	Pranjal Dutta, Prateek Dwivedi, Nitin Saxena	Demystifying the border of depth-3 algebraic circuits	**Invited** in the Special Issue on FOCS'21 of the journal SICOMP, 2021.
3.	Ashish Dwivedi, Nitin Saxena	Computing Igusa's local zeta function of	14th Biannual Algorithmic Number Theory Symposium,

		univariates in deterministic polynomial-time	ANTS-XIV, vol.4, 197--214, 2020.
4.	Manindra Agrawal, Sumanta Ghosh, Nitin Saxena	Bootstrapping variables in algebraic circuits	Proceedings of the National Academy of Sciences of the USA, PNAS, 2019. *[first version in STOC'18]*
5.	Zeyu Guo, Nitin Saxena, Amit Sinhababu	Algebraic dependencies and PSPACE algorithms in approximative complexity	**Invited** in the special issue on CCC'18: Theory of Computing, vol.15(16), 1--30, 2019.
6.	Rohit Gurjar, Arpita Korwar, Nitin Saxena, Thomas Thierauf	Deterministic Identity Testing for Sum of ROABPs	Computational Complexity, 26(4), 835-880, 2017. *[first version in Computational Complexity Conference, CCC'15]*
7.	Malte Beecken, Johannes Mittmann, Nitin Saxena	Algebraic Independence and Blackbox Identity Testing	**Invited** in the special issue of the journal: Information & Computation, vol.222, 2-19, 2013. *[Best Paper in Track A ICALP'11]*
8.	Nitin Saxena, C. Seshadhri	From Sylvester-Gallai Configurations to Rank Bounds: Improved Black-box Identity Test for Depth-3 Circuits	Journal of the ACM, vol.60, no.5, article 33, 2013. *[first version in FOCS'10]*
9.	Nitin Saxena, C. Seshadhri	Blackbox Identity Testing for Bounded Top Fanin Depth-3 Circuits: the field doesn't matter	**Invited** in the special issue on STOC'11: SIAM Journal on Computing, vol.41, no.5, 1285-1298, 2012
10.	Manindra Agrawal, Neeraj Kayal, Nitin Saxena	PRIMES is in P	Annals of Mathematics, volume 160(2), 781-793, 2004. [**Invited** by the Editor. **Won** Gödel Prize 2006 and Fulkerson Prize 2006]

Awards & Peer Recognition

Profile in the news [Hindi] [alumni-page] [Soundbyte] [AMS Notices] [more]

S.No.	*Awarding Organization*	*Award*	*Year*
1.	SERB, DST (Ministry of Science & Technology, India)	**J.C.Bose Fellowship.** Comes with a 5-year research grant.	2023
2.	Indian National Science Academy	**Fellow (FNA)**	2023
3.	IIT Bombay	**International Award for Excellence in Research in Engineering and Technology**	2023
4.	Indian National Academy of Engineering	**Fellow (FNAE)**	2022

5.	National Academy of Sciences India	**Fellow (FNASc)**	2021
6.	Indian Academy of Sciences	**Fellow (FASc)**	2021
7.	Awarded by IIT Kanpur for 2019-24-29	**N Rama Rao Chair**	2019-29
8.	In Mathematical Sciences. Awarded by Council of Scientific & Industrial Research (CSIR) India.	**Shanti Swarup Bhatnagar Prize**	2018
9.	Awarded by IIT Kanpur for 2018-21	**Young Faculty Research Fellowship**	2018-21
10	DST (Ministry of Science & Technology, India)	**DST SwarnaJayanti Fellowship** Award 2013-14 in Mathematics. Comes with a 5-year research grant titled "Three problems in Algebraic Complexity Theory"	2015-20
11	Indian National Science Academy	**Indian National Science Academy Young Scientist Medal**, in Mathematical Sciences	2015
12	European Association of Theoretical Computer Science (EATCS)	**Best Paper (Track A) at ICALP** Conference for the joint paper "Algebraic independence and blackbox identity testing"	2011
13	IEEE Conference on Computational Complexity 2006	**IEEE Conference on Computational Complexity Best Paper Awards** for the joint paper "Polynomial Identity Testing for Depth 3 Circuits"	2006
14	European Association for Theoretical Computer Science (EATCS), Association for Computing Machinery Special Interest Group on Algorithms and Computational Theory (ACM-SIGACT)	**Gödel Prize** for the joint paper "PRIMES is in P"	2006
15	Mathematical Optimization Society (MOS), American Mathematical Society (AMS)	**Fulkerson Prize** for the joint paper "PRIMES is in P"	2006
16	IIT Kanpur	**Distinguished Alumnus Award**	2003
17	Indian Business Club, Massachusetts Institute of Technology, USA	**Global Indus Technovators Award**	2003
18	IBM India Research Lab	**Outstanding PhD Student Award**	2005
19	IIT Kanpur	**Best BTech CSE Project** Award (Convocation Ceremony)	2002

Other Honors: *[more]*

S.No.	*Awarding Organization*	*Recognition*	*Year*

20	DST, Ministry of Science & Technology, India	**Profiled in the top 75 scientists** (under age 50) "shaping today's India"	2022
21	Academic Senate, IIT Kanpur	**Letters from the Chairman** for Teaching & Research	2015-20
22	SERB, DST (Ministry of Science & Technology, India)	Adjudged the **Excellent** grade on project completion in: *Fast Track Scheme for Young Scientist in Mathematical Sciences*.	2013-16
23	Voted by the IIT-K Alumni to celebrate 50 years	**IITK@50 Votes**. Voted in the top 50 prominent alumni.	2010
24	Infosys Technologies Ltd.	**Infosys PhD Fellowship**	2002-06
25	IIT Kanpur	**Notional Scholarship**. For excellent performance in the first 2 semesters of study under the B.Tech (IIT-K) program	1999
26	Indian National Mathematics Olympiad. Bhabha Atomic Research Center, Mumbai	Selected to attend the International Mathematics Olympiad Training Camp (IMOTC '97 & IMOTC '98) and awarded the Prize for ``**Best Solution to a Challenging Problem**'' in both the Camps	1997-98

Invited Talks & Meetings

Almost all slides are available at https://www.cse.iitk.ac.in/users/nitin/talks.html .

1. Indo-European Conference on Mathematics, IISER Pune (*Plenary Speaker*) *2026*
2. Workshop on Algebraic Complexity (8th-WACT), Ruhr University Bochum *2025*
3. Varied Landscape of Mathematics (Maths Day), MATH-STAT, IIT Kanpur *2025*
4. NASI, 94th AGM, Session on AI & ML, IISER Bhopal *2024*
5. Distinguished Lecture Series, University of Waterloo, Canada *2024*
6. Colloquium, and the Runaway Seminar, TIFR-CAM, Bengaluru *2024*
7. Workshop on PQC, IIT-ISM Dhanbad (virtual) *2024*
8. Keynote on *AI Innovations for Society*, PIWOT, Pan IIT, Bengaluru *2023*
9. INSA, 89th AGM, CSIR-Centre for Cellular & Molecular Biology, Hyderabad *2023*
10. Talk, National Centre for Good Governance (NCGG), Mussoorie *2023*
11. Workshop ("Recent trends in Algebra"), Institut Henri Poincaré, Paris *2023*
12. Institute Colloquium, IIT Bombay *2023*
13. Workshop ("Algebra and Computation"), Göteborg, Sweden *2023*
14. IASc Convention, IISc Bengaluru *2023*
15. Workshop on Algebraic Complexity (7th-WACT), Warwick Maths Institute, UK *2023*
16. IMSc60 Celebration, Chennai *2023*
17. INAE Convention, BARC Mumbai *2022*
18. Amrit Mahotsav Colloquium, CEBS Mumbai (virtual) *2022*
19. UG Research Day: Alumni Cell, IIT Palakkad (virtual) *2022*
20. Panel discussion in Google's Research Week (virtual) *2022*

21. GCT Conference, CMI (virtual) *2022*
22. Media AICTE, Delhi (virtual) *2021*
23. National Maths Day, IIT/ISM Dhanbad (virtual) *2021*
24. National Maths Day, BITS Pilani (virtual) *2021*
25. Oberseminar, Universität Bayreuth, Germany (virtual) *2021*
26. Subbarao Symposium on Number Theory, IISER Pune (virtual) *2021*
27. 4th IPMCCC, Tehran, Iran (virtual) *2021*
28. SVIM Indore (virtual) *2021*
29. National Maths Day, SRMIST Ramapuram, Chennai (virtual) *2020*
30. ICNTDM'20 marking Ramanujan's centennial, RSET Kochi (virtual) *2020*
31. STCS Seminar, TIFR (virtual) *2020*
32. NPTEL Live Special Lecture Series (virtual) *2020*
33. OCS 2019, Hyatt Lucknow *2019*
34. CSE Seminar, IIT Delhi *2019*
35. Workshop on Algebraic Complexity Theory (6th-WACT), ICTS Bengaluru *2019*
36. PSIT Kanpur *2023, 2022, 2019*
37. Workshop, Simons Institute, Berkeley (USA) *2018*
38. MATH-STAT Colloquium, IIT Kanpur *2018*
39. Workshop on Algebraic Complexity (5th-WACT), Université Paris-Diderot *2018*
40. Workshop National-Math-Initiative, IMSc, Chennai *2017*
41. Workshop on Algebraic Complexity Theory (4th-WACT), TAU, Israel *2016*
42. CMI Seminar, Chennai *2015*
43. Seminars, UPMC Paris-6 (France) *2014*
44. NIWC, MNNIT, Allahabad *2018, 2014*
45. Algebraic Graph Theory Conference, Villanova University (USA) *2014*
46. Big Tech Day 7, TNG Tech Consulting, Munich (Germany) *2014*
47. Workshops on Algebraic Complexity (2nd-WACT), TIFR (Mumbai) and Saarbrücken (Germany) *2014*
48. Seminar and workshop, Bonn (Germany) and Linz (Austria) *2013*
49. Seminar, ENS Lyon, France *2012*
50. Turing Centenary Celebration, IIT Kanpur/Delhi, India *2012*
51. Oberseminar Logik/Informatik/Diskrete Math., Universität Bonn, Germany *2011/ 2008/ 2007*
52. Max Planck Institut für Informatik, Saarbrücken, Germany *2011*
53. RAND-Workshop on Association Schemes, Bonn *2011*
54. Number Theory Workshop, University of Warsaw, Poland *2010*
55. ICM Satellite Workshop, IISc Bangalore, India *2010*
56. DFG German-Indian Workshop, Bonn *2010*
57. Computational Complexity at Dagstuhl, Germany *2024, 2022, 2020, 2018, 2016, 2009, 2007*
58. Oberseminar Informatik, Universität Ulm, Germany *2009*
59. 23rd EURO Operational Research Conference, Bonn *2009*
60. Number Theory Seminar, MPI für Mathematik, Bonn *2008*
61. Barbados Workshop on Computational Complexity, Bellairs *2008*
62. Complexity Theory at Oberwolfach, Germany *2007*
63. Algorithmic Number Theory, University of Turku, Finland *2007*
64. Dutch Theory Day, Utrecht, The Netherlands *2007*
65. Math. Colloquium, Amsterdam University, The Netherlands *2007*
66. IRISS, Chennai *2006*
67. Future directions in algorithmic number theory, AIM, Palo Alto, California, USA *2003*
68. ISI Delhi & Delhi University *2002*
69. Indocrypt Conference, Hyderabad, India *2002*

PhD/ Postdoc Supervision

Their theses are available at https://www.cse.iitk.ac.in/users/nitin/students.html .

Research Group at CSE, IITK (2013--)

PhD

1. Foram Lakhani (Jul'23--)
2. V.Madhavan (Jul'22--) [**on C3iHub Fellowship**] (joint with Prof. Manindra Agrawal)
   ("Algorithmic Arithmetic Geometry", 2025)
   (post-PhD: *Postdoc in Universität des Saarlandes, Germany*)
3. Tufan Singha Mahapatra (Jul'22--)
4. Anindya Ganguly (July'21--) [**on TCS Fellowship**] (joint with Prof. Angshuman Karmakar)
5. CS Bhargav (Jul'19--) ("On Problems of Hardness, Counting and Factoring in Algebraic Complexity", 2025)
   (post-PhD: *Postdoc in Universität Regensburg, Germany*)
6. Prateek Dwivedi (Dec'18--Jun'24 exp.) ("Treading the Borders for Explicitness, Circuit Factoring, and Identity Testing", 2024)
   (post-PhD: *Postdoc in ITU Copenhagen, Denmark*)
7. Pranjal Dutta [**on Google PhD Fellowship:2018-22**] ("A Tale of Hardness, De-randomization and De-bordering in Complexity Theory", 2022)
   [**Won ACM India Doctoral Dissertation Award 2023]**
   (Post-PhD: *Faculty in NTU Singapore from 2025*. Postdoc in NUS, Singapore & Oxford, UK)
8. Ashish Dwivedi ("Polynomials over composites: Compact root representation via ideals and algorithmic consequences", 2023) (joint with Prof. Rajat Mittal)
   (Post-PhD: *Postdoc in Ohio State, USA*)
9. Pranav Bisht ("Structural results on sparse factoring and identity testing", 2022)
   (Post-PhD: *Faculty in IIT-ISM-Dhanbad 2023*. *Postdoc in Boston, USA*)
10. Sumanta Ghosh ("Low variate polynomials: Hitting-sets and Bootstrapping", 2019)
    (Post-PhD: *Faculty in CMI from 2023*. Postdoc in CalTech USA, IIT Bombay)
11. Amit K. Sinhababu ("Power series in complexity: Algebraic Dependence, Factor Conjecture and Hitting Set for Closure of VP", 2019)
    (Post-PhD: *Faculty in CMI from 2022*. Postdoc in Ulm, Germany)
12. Arpita Korwar ("Polynomial identity testing and lower bounds for sum of special arithmetic branching programs", 2016) (joint with Prof. Manindra Agrawal)
    (Post-PhD: *Faculty in IIT GOA from 2019*. Postdoc in Paris Diderot, France)
13. Rohit Gurjar ("Derandomizing PIT for ROABP and isolation lemma for special graphs", 2015) (joint with Prof. Manindra Agrawal)
    [**Won ACM India Doctoral Dissertation Award 2017**]
    (Post-PhD: *Faculty in IIT BOMBAY from 2018*. Postdoc in Ulm Germany, Tel-Aviv Israel, CalTech USA)

Postdoc

14. Madhurima Mukhopadhyay, 2022-24 (PhD from ISI Kolkata)
15. Zeyu Guo, 2017-19 (PhD from CalTech, USA) (Post-Postdoc: *Faculty, Ohio State, USA.* Postdoc in Texas USA, Haifa Israel)

Group in Bonn University, Germany (2008-2013)

PhD

16. Manuel Arora ("Extensibility of association schemes and GRH-based deterministic polynomial factoring", 2013) (with Prof. Marek Karpinski)
    (Post-PhD: *Apple, NetFlix, Twitter*. Postdoc in CalTech, USA)
17. Johannes Mittmann ("Independence in Algebraic Complexity Theory", 2013)
    [**'Ausgezeichnet Note'-- an outstanding grade given to less than 5%** of the theses in Mathematics, University of Bonn]
    (Post-PhD: *Member in Bundesamt fuer Sicherheit in der Informationstechnik, Bonn*.)

Postdoc

18. Peter Scheiblechner, 2011-12 (PhD from Berlin) (Post-Postdoc: *Lecturer, Lucerne University, Switzerland*)

Supervision of Bachelor's/Master's thesis

Research Group at CSE, IITK (2013--)

Masters

1. Bhaskar Goyal (2025. MSc Thesis student from NISER Bhubaneswar)
2. Diptajit Roy ("Counting points on algebraic curves over finite fields and applications", 2025.)
3. Anagha G ("Polynomial identity testing of non-commutative circuits", 2025. MSc Thesis student from BITS Pilani Hyderabad)
4. Sagar Arora ("PIT and separation between low-variate Read Once ABP classes", 2022)
5. Sanyam Agarwal ("Factorization of sparse polynomials of bounded individual degree", 2022. MSc Thesis student from CMI Chennai)
6. Sagnik Dutta ("Lower Bounds for Constant Depth Algebraic Circuits", 2023. MSc Thesis student from CMI Chennai)
7. Sayak Chakrabarti ("Multivariate polynomials modulo prime powers: their roots, zeta-function and applications", 2022. BT-MT) [**Won Best BT-MT Thesis'22**]
8. Devansh Shringi ("Constructions over finite fields with applications to local Ramanujan graph and algebraic dependence", 2022. BT-MT) [**Won Best BT-MT Thesis'22**]
9. Diptajit Roy (MS, Jul'19-Dec'20; converted to PhD)
10. Abhibhav Garg ("Special case algorithms for Nullstellensatz and transcendence degree", 2020. BT-MT)
11. Abhiroop Sanyal ("Sum of powers of univariate polynomials in algebraic complexity theory", 2020. MSc Thesis student from CMI Chennai)
12. Subhayan Saha ("Towards a PIT for log-variate ROABPs", 2020. MSc Thesis student from CMI Chennai)
13. Pranjal Dutta ("Discovering the roots: Unifying and extending results on multivariate polynomial factoring in algebraic complexity", 2018. MSc Thesis student from CMI Chennai)
14. Pranav Bisht ("On Hitting Sets for Special Depth-4 Circuits", 2017)
15. Ashish Dwivedi ("On the Complexity of Hilbert's Nullstellensatz over Positive Characteristic", 2017)
16. Kartik Kale ("Exp(n+d)-time Algorithms for Computing Division, GCD and Identity Testing of Polynomials", 2017)
17. Shubham Sahai Srivastava (2014 -- changed the Advisor in 2016)
18. Ashutosh Tiwari ("Cubic forms equivalence over complex", 2016)
19. Rishabh Vaid ("Blackbox Identity Testing for Simple Depth 3 Circuits", 2015)
20. Anurag Pandey ("Algebraic independence: Criteria and structural results over diverse fields", 2015. BT-MT EE)
    (Post-MT: *Faculty in IIT MADRAS from 2022*. PhD from MPI Saarbrücken, Germany)
21. Amit K. Sinhababu ("Testing algebraic independence of polynomials over finite fields", 2014)
22. Pritam Majumder ("Uniqueness of factorization in quadratic fields", 2014. MSc Math)

Bachelor (UGP)

1. Shaurya Johari
2. Sahil Kumar Goyat
3. Sankalp Mittal (“Methods to Prove Superpolynomial Lower Bounds”, 2024)
4. Rishabh Kothary (“Sparsity Bound of Polynomials with Bounded Individual Degree”, 2022) (“Sparsity Bound of Square Polynomials”, 2022) [**Proficiency Award’23**]
5. Farzan Byramji (“The Graph Isomorphism Problem”, Jan'22)
6. Mohd Talib Siddiqui (“The Graph Isomorphism Problem”, Jan'22)
7. Sayak Chakrabarti ("On factorization and root counting mod prime powers", Jul'20)
8. Rishabh Batra ("Integer & polynomial factoring ideas", Jul'20)
9. Devansh Shringi ("PIT for depth-4 bounded top & bottom fanin", Jul'20, Jan'20)
10. Shubhojyoti Nath ("The Complexity of Hilbert's Nullstellensatz", 2019)
11. Abhibhav Garg ("On Algebraic dependence", 2018)
12. Tushant Mittal ("Algebraic Independence", 2017)
13. Shaswat Chaubey ("Lower-bounds & learning algorithms", 2016)
14. Abhimanyu Yadav ("Luks' graph isomorphism", 2016) ("Babai's graph isomorphism", 2016)
15. Himanshu Shukla ("Generalized form of Burgess lemma", 2015) ("C-Z type algorithm for factoring over finite fields", 2016)
16. Vishwas Bhargav ("Square root modulo p", 2015)
17. Anurag Sahay ("Additive Combinatorics and Incidence Geometry: The Kakeya Problem", 2014)
18. Vijay Keswani ("Additive Combinatorics and Incidence Geometry: The Szemeredi-Trotter Theorem", 2014)
19. Kundan Kumar ("Deterministic Polynomial Factorisation Over a Finite Field", 2014)

Research assistants/ Interns

1. Pranjal Dutta, Summer'15	2. Akash Jena, Summer'16
3. Rahul Hirwani, Summer'16	4. Vishwas Bhargav, Jun'16--Jul'17
5. Shivani Kumari, Summer'17	6. Subhayan Saha, Summer'17
7. Abhiroop Sanyal, Summer'17	8. Devashish Sonowal, Summer'18
9. Yashaswi Patel, Summer'19	10. Anupam Datta, Summer'19
11. Sagnik Dutta, Summer'19	12. Somnath Bhattacharjee, Summer'21
13. Saswata Mukherjee, Summer'21	14. Faizan Ali Mir, Jan-Feb'22
15. Shaurya Bhatnagar, NPTEL-intern, Mar-May'22	16. Rishabh Kothary, Summer'22
17. Hrishikesh Saikia, Summer'22	18. Sagar Arora, Summer’22
19. Soham Chatterjee, Winter’22, Summer’23	20. Rishav Gupta, Winter’22
21. Srijan Chakraborty, Summer’23	22. Aryan Kusre, Summer’23
23. Rishabh Gupta, Summer’23	24. Saswata Mukherjee, Summer’23
25. Ujjwal Sarswat, Summer’23	26. Vishnu Sonwane, Summer’23
27. Manjeet Singh, Summer’23	28. Rishabh Kothary, Jul’23-Feb’24
29. Keshav Saxena, Winter’23	30. Abhishek Goel, Winter’23
31. S.Dheeraj Kumar, Winter’23	32. Vivek Yadav, Summer’24
33. Suryaansh Jain, Summer’24	34. Suneet Patil, Summer’24
35. Vardhan Roy, Summer’24	36. Ankan Kar, Summer’24
37. Harshita Singh, Summer’24	38. Bhaskar Goyal, Summer’24
39. Siddhesh Umarjee, Summer'25	40. Arikith Roy Chowdhury, Summer'25
41. Shravan Agrawal , Summer'25	42. Devansh Bhardwaj, Summer'25

Group in Bonn University, Germany (2008-2013)

Diplom (comparable to M.S.)

1. Manuel Arora (“Theory of m-schemes and applications to polynomial factoring”, 2010)
2. Jesse Beisegel (“Additive Combinatorics, Addition Cayley graphs and Hamiltonicity”, 2012)

3. Nils Frohberg ("Sylvester-Gallai theorems and identities over R", 2010)
4. Jesko Hüttenhain ("From Sylvester-Gallai configurations to branched coverings", 2012)
5. Leonhard Schneider ("Equivalence of quantum and classical computation in interactive proof systems and refereed games", 2012)
6. Lars Wallenborn ("Computing the Hilbert symbol, quadratic form equivalence and integer factoring", 2013)

Bachelor (Thesis)

1. Kathrin Sayk ("Key Distribution", 2011)
2. Jens Ziegler ("Smoothed analysis of the TSP algorithms", 2012)

Research assistants/ Interns

1. Malte Beecken, 2009-11

Knowledge Dissemination (e.g. MooC)

Videos/ slides are available at https://www.cse.iitk.ac.in/users/nitin/teaching.html .

1. "E-Diploma in AI" course: *Probability for AI*, 2025-/I (in prep).
2. Training module for Government Officials: *Introduction to AI/ML and Blockchain*, 2025-.
3. NPTEL/Swayam course: *Data Structures & Algorithms*, 2025-26/I.
4. NPTEL/Swayam course: *Discrete Mathematics for CS*, 2024-25/II.
5. NPTEL/Swayam course: *Computational Arithmetic-Geometry for Algebraic Curves*, 2025-26/I; 2024-25/I.
6. NPTEL/Swayam course: *Basics of Computational Complexity*, 2023-24/II.
7. NPTEL/Swayam course: *Probability for Computer Science*, 2023-24/II; 2021-22/I.
8. NPTEL/Swayam course: *Randomized Methods in Complexity*, 2025-26/I; 2024-25/I; 2022-23/II; 2020-21/II.
9. NPTEL/Swayam course: *Computational Number Theory & Algebra*, 2024-25/II; 2022-23/I; 2020-21/I.
10. NPTEL/Swayam course: *Arithmetic Circuit Complexity*, 2021-22/II; 2019-20/II.

Teaching

Lectures are available at https://www.cse.iitk.ac.in/users/nitin/teaching.html .

Teaching in CSE, IITK (2013--)

1. Introduction to Programming; 2015-16/I, ESc101 (**core** for the Institute)
2. Data Structures & Algorithms; 2023-24/II, ESO207 (**core** for the Institute)
3. Technical Communication; 2024-25/I; 2017-18/I; 2014-15/I, CS300/888 (**core** for UG/PG)
4. Mathematics for Computer Science - I - Discrete Mathematics; 2022-23/I; 2016-17/I, CS201 (**core** for UG)
5. Mathematics for Computer Science - III – Probability; 2020-21/II, CS203 (**core** for UG)
6. Algorithms –II; 2019-20/I, CS345 (**core** for UG)
7. Design & Analysis of Algorithms; 2017-18/II, CS602 (**core** for PG)
8. Computational Complexity Theory; 2021-22/I; 2017-18/I ; 2013-14/II, CS640
9. Randomized methods in Computational Complexity; 2025-26/I; 2023-24/I; 2020-21/I; 2018-19/I; 2014-15/II, CS747 (**New Course**)
10. Computational Number Theory & Algebra; 2024-25/II; 2021-22/II; 2019-20/II; 2016-17/II; 2014-15/I, CS681
11. Arithmetic Circuit Complexity; 2024-25/I; 2018-19/II; 2015-16/II, CS748 (**New Course**)
12. Computational Arithmetic-Geometry & Applications; 2022-23/II; 2013-14/I, CS688 (**New Course**)

Teaching in Bonn (2008-13)

13. Graduate Seminar on Algorithms in Real Algebraic Geometry; Summer Semester 2012 (**New Course**)
14. Graduate Seminar on Topics in Computational Algebraic Geometry; Winter Semester 2011/12 (**New Course**)
15. Graduate Seminar on Topics in Quantum Computation; Summer Semester 2011 (**New Course**)
16. Graduate Seminar on Topics in Modern Cryptography; Winter Semester 2010/11 (**New Course**)
17. Graduate Seminar on Topics in Algebra & Computation; Summer Semester 2010 (**New Course**)
18. Graduate Seminar on Topics in Computational Complexity; Winter Semester 2009/10
19. Randomized Methods in Computational Complexity; Summer Semester 2009 (**New Course**)
20. Computational Complexity Theory; Winter Semester 2008/09 (**New Course**)
21. Topics in Computational Algebra; Summer Semester 2008 (**New Course**)

Publications (peer-reviewed)

All reprints are available at https://www.cse.iitk.ac.in/users/nitin/research.html .
Scholar: Citations ~ 4439 ; h-index ~ 25

Complete list of publications in standard refereed **journals**:

S.No.	Authors (in alphabetical order)	Title	Venue (peer-reviewed)
01.	Pranav Bisht, Nitin Saxena	Derandomization via symmetric polytopes: Poly-time factorization of certain sparse polynomials	ACM Transactions on Computation Theory, 2025
02.	C.S. Bhargav, Prateek Dwivedi, Nitin Saxena	Lower bounds for the sum of small-size algebraic branching programs	**Invited** to the special issue of Theoretical Computer Science, vol.1041, 115214, 2025.
03.	C.S. Bhargav, Sagnik Dutta, Nitin Saxena	Improved Lower Bound, and Proof Barrier, for Constant Depth Algebraic Circuits	ACM Transactions on Computation Theory, 16(4): 23, 1-22, doi, 2024.
04.	Sayak Chakrabarti, Ashish Dwivedi, Nitin Saxena	Solving polynomial systems over non-fields and applications to modular polynomial factoring	Journal of Symbolic Computation, vol.125, 102314, 2024.
05.	Pranjal Dutta, Nitin Saxena, Thomas Thierauf	Weighted sum-of-squares lower bounds for univariate polynomials imply VP≠VNP	Comput.Complex., 33:3, 2024.
06.	Rishabh Batra, Nitin Saxena, Devansh Shringi	Explicit construction of q + 1 regular local Ramanujan graphs, for all prime-powers q	Comput.Complex., 32(1):2, 2023.
07.	Pranjal Dutta, Nitin Saxena, Amit Sinhababu,	Discovering the roots: Uniform closure results for algebraic classes under factoring	J.ACM, vol.69:3, 18:1-39, June 2022.
08.	Pranjal Dutta, Prateek Dwivedi, Nitin Saxena	Demystifying the border of depth-3 algebraic circuits	**Invited** in the Special Issue on FOCS'21 of the journal SICOMP, 2021.
09.	Pranav Bisht, Nitin Saxena	Blackbox identity testing for sum of special ROABPs and its border class	Comput.Complex., vol.30:8, 1-48, 2021.
10.	Ashish Dwivedi, Rajat Mittal, Nitin Saxena	Efficiently factoring polynomials modulo p^4	Journal of Symbolic Computation, 104:805--823, 2021.
11.	Manindra Agrawal, Sumanta Ghosh, Nitin Saxena	Bootstrapping variables in algebraic circuits	Proceedings of the National Academy of Sciences of the USA, PNAS, 2019.
12.	Zeyu Guo, Nitin	Algebraic dependencies and	**Invited** in the special issue: Theory

	Saxena, Amit Sinhababu	PSPACE algorithms in approximative complexity	of Computing, vol.15(16), 1--30, 2019.
13.	Anurag Pandey, Nitin Saxena, Amit Sinhababu	Algebraic independence over positive characteristic: New criterion and applications to locally low algebraic rank circuits	Computational Complexity 27(4): 617-670, 2018.
14.	Gábor Ivanyos, Marek Karpinski, Miklos Santha, Nitin Saxena, Igor E Shparlinski	Polynomial interpolation and identity testing from high powers over finite fields	Algorithmica, 80(2), 560-575, 2018.
15.	Rohit Gurjar, Arpita Korwar, Nitin Saxena	Identity testing for constant-width, and commutative, read-once oblivious ABPs	**Invited** in the special issue of the journal: Theory of Computing, 13 (999), 2017, pp. 1–21.
16.	Rohit Gurjar, Arpita Korwar, Nitin Saxena, Thomas Thierauf	Deterministic Identity Testing for Sum of ROABPs	Computational Complexity, 26(4), 835-880, 2017.
17.	Manindra Agrawal, Chandan Saha, Ramprasad Saptharishi, Nitin Saxena	Jacobian hits circuits: Hitting-sets, lower bounds for depth-D occur-k formulas & depth-3 transcendence degree-k circuits	**Invited** in the special issue of the journal: SIAM Journal on Computing: vol. 45, No. 4, pp. 1533–1562, 2016
18.	Manindra Agrawal, Rohit Gurjar, Arpita Korwar, Nitin Saxena	Hitting-sets for ROABP and sum of set-multilinear circuits	SIAM Journal on Computing, vol.44, no.3, 669-697, 2015
19.	Johannes Mittmann, Nitin Saxena, Peter Scheiblechner	Algebraic Independence in Positive Characteristic -- A p-adic Calculus	Transactions of the American Mathematical Society, vol.366, no.7, 3425-3450, 2014
20.	Manuel Arora, Gábor Ivanyos, Marek Karpinski, Nitin Saxena	Deterministic polynomial factoring and association schemes	London Mathematical Society Journal Of Computation And Mathematics. 2014, 17(1), 123-140.
21.	Malte Beecken, Johannes Mittmann, Nitin Saxena	Algebraic Independence and Blackbox Identity Testing	**Invited** in the special issue of the journal: Information & Computation, vol.222, 2-19, 2013.
22.	Chandan Saha, Ramprasad Saptharishi, Nitin Saxena	A case of depth-3 identity testing, sparse factorization and duality	Computational Complexity. 2013, 22(1), 39-69.
23.	Nitin Saxena, C. Seshadhri	From Sylvester-Gallai Configurations to Rank Bounds: Improved Black-box Identity Test for Depth-3 Circuits	Journal of the ACM, vol.60, no.5, article 33, 2013
24.	Nitin Saxena, C. Seshadhri	Blackbox Identity Testing for Bounded Top Fanin Depth-3 Circuits: the field doesn't matter	**Invited** in the special issue of the journal: SIAM Journal on Computing, vol.41, no.5, 1285-1298, 2012
25.	Gábor Ivanyos, Marek Karpinski, Lajos Rónyai, Nitin Saxena	Trading GRH for algebra: algorithms for factoring polynomials and related structures.	Mathematics of Computation, vol.81, 493-531, 2012
26.	Nitin Saxena,C. Seshadhri	An Almost Optimal Rank Bound for Depth-3 Identities	SIAM Journal on Computing, vol.40, no.1, 200-224, 2011.
27.	Gábor Ivanyos, Marek Karpinski, Nitin Saxena	Deterministic Polynomial Time Algorithms for Matrix Completion Problems	SIAM Journal on Computing, vol.39, no.8, 3736-3751, 2010
28.	Nitin Saxena, Simone Severini, Igor E. Shparlinski	Parameters of Integral Circulant Graphs and Periodic Quantum Dynamics	International Journal of Quantum Information, volume 5(3), 417-430, 2007
29.	Neeraj Kayal, Nitin	Polynomial Identity Testing for	**Invited** in the special issue of the

	Saxena	Depth 3 Circuits	journal: Computational Complexity, volume 16(2), 115-138, 2007.
30.	Neeraj Kayal, Nitin Saxena	On the Ring Isomorphism & Automorphism Problems	**Invited** in the special issue of the journal: Computational Complexity, volume 15(4), 342-390, 2007
31.	Manindra Agrawal, Neeraj Kayal, Nitin Saxena	PRIMES is in P	Annals of Mathematics, volume 160(2), 781-793, 2004. [**Invited** by the Editor. **Won** Gödel Prize 2006 and Fulkerson Prize 2006]

Complete list of papers published in prestigious peer-reviewed **Conferences/ Proceedings**:

S.No.	**Authors (in alphabetical order)**	**Title**	**Venue (peer-reviewed)**
32.	Abhibhav Garg, Rafael Oliveira, Nitin Saxena	Primes via Zeros: Interactive proofs for the primality of natural classes of ideals	57th Annual ACM Symposium on Theory of Computing (STOC), 2025.
33.	C.S. Bhargav, Prateek Dwivedi, Nitin Saxena	Learning the coefficients: A presentable version of border complexity and applications to circuit factoring	56th Annual ACM Symposium on Theory of Computing (STOC), 130-140, 2024.
34.	C.S. Bhargav, Prateek Dwivedi, Nitin Saxena	Lower bounds for the sum of small-size algebraic branching programs	Annual Conference on Theory and Applications of Models of Computation (TAMC), 355-366, 2024. [One of the **selected** best in the conference]
35.	Anindya Ganguly, Angshuman Karmakar, Nitin Saxena	VDOO: A short, fast, post-quantum multivariate digital signature scheme	24th INDOCRYPT, vol.14460, pp.197-222, 2023. *https://ia.cr/2023/1925*
36.	Sayak Chakrabarti, Nitin Saxena	An effective description of the roots of multivariates mod p^k and the related Igusa's local zeta function	48th International Symposium on Symbolic and Algebraic Computation (ISSAC), 135-144, 2023.
37.	Pranav Bisht, Nitin Saxena	Derandomization via symmetric polytopes: Poly-time factorization of certain sparse polynomials	42nd Foundations of Software Technology and Theoretical Computer Science (FSTTCS), 2022: 9:1-9:19.
38.	Pranjal Dutta, Nitin Saxena	Separated borders: Exponential-gap fanin-hierarchy theorem for approximative depth-3 circuits	63rd IEEE Annual Symposium on Foundations of Computer Science (FOCS), 2022: 200-211.
39.	C.S. Bhargav, Sagnik Dutta, Nitin Saxena	Improved lower bound, and proof barrier, for constant depth algebraic circuits	47th International Symposium on Mathematical Foundations of Computer Science (MFCS), 2022: 18:1-18:16. [Awarded **Best Student** paper]
40.	Pranjal Dutta, Prateek Dwivedi, Nitin Saxena	Demystifying the border of depth-3 algebraic circuits	62nd FOCS'21, pp. 92-103, 2022. [One of the **selected** best in the conference]
41.	Pranjal Dutta, Prateek Dwivedi,	Deterministic identity testing paradigms for bounded top-	36th Computational Complexity Conference (CCC), vol.200, 11:1--11:27, 2021.

	Nitin Saxena	fanin depth-4 circuits	
42.	Pranjal Dutta, Nitin Saxena, Thomas Thierauf	A Largish Sum-of-Squares Implies Circuit Hardness and Derandomization	12th Innovations in Theoretical Computer Science (ITCS), vol.185, 23:1--23:20, 2021.
43.	Abhibhav Garg, Nitin Saxena	Special-case algorithms for blackbox radical membership, Nullstellensatz and transcendence degree	45th International Symposium on Symbolic and Algebraic Computation (ISSAC), 186--193, 2020.
44.	Ashish Dwivedi, Nitin Saxena	Computing Igusa's local zeta function of univariates in deterministic polynomial-time	14th Biannual Algorithmic Number Theory Symposium, ANTS-XIV, vol.4, 197--214, 2020.
45.	Ashish Dwivedi, Rajat Mittal, Nitin Saxena	Counting basic-irreducible factors mod p^k in deterministic poly-time and p-adic applications	34th Computational Complexity Conference (CCC), 15:1--15:29, 2019.
46.	Ashish Dwivedi, Rajat Mittal, Nitin Saxena	Efficiently factoring polynomials modulo p^4	44th International Symposium on Symbolic and Algebraic Computation (ISSAC), 139--146, 2019.
47.	Zeyu Guo, Nitin Saxena, Amit Sinhababu	Algebraic dependencies and PSPACE algorithms in approximative complexity	33rd CCC'18, 10:1-10:21, 2018. [One of the **selected** best in the conference]
48.	Michael A. Forbes, Sumanta Ghosh, Nitin Saxena	Towards blackbox identity testing of log-variate circuits	45th ICALP'18, 54:1-54:16, 2018.
49.	Pranjal Dutta, Nitin Saxena, Amit Sinhababu,	Discovering the roots: Uniform closure results for algebraic classes under factoring	50th STOC'18, 1152-1165, 2018.
50.	Manindra Agrawal, Sumanta Ghosh, Nitin Saxena	Bootstrapping variables in algebraic circuits	50th STOC'18, 1166-1179, 2018.
51.	Vishwas Bhargava, Gábor Ivanyos, Rajat Mittal, Nitin Saxena	Irreducibility and deterministic r-th root finding over finite fields	42nd International Symposium on Symbolic and Algebraic Computation (ISSAC), 2017, 37--44.
52.	Anurag Pandey, Nitin Saxena, Amit Sinhababu	Algebraic independence over positive characteristic: New criterion and applications to locally low algebraic rank circuits	LIPIcs-Leibniz International Proceedings in Informatics, 58, 74:1-74:15, 2016 (41st International Symposium on Mathematical Foundations of Computer Science, MFCS'16)
53.	Manindra Agrawal, Nitin Saxena, Shubham Sahai Srivastava	Integer factoring using small algebraic dependencies	LIPIcs-Leibniz International Proceedings in Informatics, 58, 6:1-6:14, 2016 (41st International Symposium on Mathematical Foundations of Computer Science, MFCS'16)
54.	Rohit Gurjar, Arpita Korwar, Nitin Saxena	Identity testing for constant-width, and commutative, read-once oblivious ABPs	LIPIcs-Leibniz International Proceedings in Informatics, 50, 29:1-29:16, 2016 (31st Computational Complexity Conference, CCC'16). [One of the **selected** best in the conference]
55.	Rohit Gurjar, Arpita Korwar, Nitin Saxena, Thomas Thierauf	Deterministic Identity Testing for Sum of ROABPs	LIPIcs-Leibniz International Proceedings in Informatics, 33, 323-346, 2015 (30th Computational Complexity Conference, CCC'15).
56.	Manindra Agrawal,	Quasi-polynomial Hitting-	45th ACM Symposium on Theory of

	Chandan Saha, Nitin Saxena	set for Set-depth-D Formulas	Computing (STOC), pp.321-330, 2013
57.	Manindra Agrawal, Chandan Saha, Ramprasad Saptharishi, Nitin Saxena	Jacobian hits circuits: Hitting-sets, lower bounds for depth-D occur-k formulas & depth-3 transcendence degree-k circuits	44th ACM Symposium on Theory of Computing (STOC), pp.599-614, 2012 [One of the **selected** best in the conference]
58.	Malte Beecken, Johannes Mittmann, Nitin Saxena	Algebraic Independence and Blackbox Identity Testing	38th International Colloquium on Automata, Languages and Programming (ICALP), pp.137-148, 2011. [Awarded the **Best Paper** in Track A]
59.	Nitin Saxena, C. Seshadhri	Blackbox Identity Testing for Bounded Top Fanin Depth-3 Circuits: the field doesn't matter	43rd ACM Symposium on Theory of Computing (STOC), pp.431-440, 2011 [One of the **selected** best in the conference]
60.	Nitin Saxena, C. Seshadhri	From Sylvester-Gallai Configurations to Rank Bounds: Improved Black-box Identity Test for Depth-3 Circuits	51st Annual IEEE Symposium on Foundations of Computer Science (FOCS), pp.21-29, 2010
61.	Chandan Saha, Ramprasad Saptharishi, Nitin Saxena	The Power of Depth 2 Circuits over Algebras	29th Foundations of Software Technology and Theoretical Computer Science (FSTTCS), pp.371-382, 2009
62.	Nitin Saxena, C. Seshadhri	An Almost Optimal Rank Bound for Depth-3 Identities	24th IEEE Conference on Computational Complexity (CCC), pp.137-148, 2009
63.	Gábor Ivanyos, Marek Karpinski, Nitin Saxena	Schemes for Deterministic Polynomial Factoring	34th International Symposium on Symbolic and Algebraic Computation (ISSAC), pp.191-198, 2009
64.	Nitin Saxena	Diagonal Circuit Identity Testing and Lower Bounds	35th International Colloquium on Automata, Languages and Programming (ICALP), LNCS 5125, pp.60-71, 2008
65.	Neeraj Kayal, Nitin Saxena	Polynomial Identity Testing for Depth 3 Circuits	21st IEEE Conference on Computational Complexity (CCC), pp.9-17, 2006. [Awarded the **Best Paper** and **Best Student** Paper Awards]
66.	Manindra Agrawal, Nitin Saxena	Equivalence of F-algebras and cubic forms	23rd STACS, Springer LNCS 3884, pp.115-126, 2006
67.	Manindra Agrawal, Nitin Saxena	Automorphisms of Finite Rings and Applications to Complexity of Problems	22nd Symposium on Theoretical Aspects of Computer Science (STACS), Springer LNCS 3404, pp.1-17, 2005
68.	Neeraj Kayal, Nitin Saxena	On the Ring Isomorphism & Automorphism Problems	20th IEEE Conference on Computational Complexity (CCC), pp.2-12, 2005 [One of the **selected** best in the conference]

List of the most outstanding **Technical Reports**/ Review Articles:

S.No.	Authors (in alphabetical order)	Title	Venue/ Status
69.	C.S. Bhargav, Prateek Dwivedi, Nitin Saxena	A primer on the closure of algebraic complexity classes under factoring	exp.2025 [**Invited** by RTCA Organizers]
70.	Nitin Saxena, Madhavan Venkatesh	Counting points on surfaces in polynomial time	*Submitted, 2025*
71.	Dipayan Das, Anindya	MQuBS: A Short, Round-	*Submitted, 2025*

	Ganguly, Angshuman Karmakar, Nitin Saxena	Optimal Blind Signature with Post-Quantum Security	
72.	Diptajit Roy, Nitin Saxena, Madhavan Venkatesh	Complexity of counting points on curves, and the factor $P_1(T)$ of the zeta function of surfaces	*Submitted, 2025*
73.	Nitin Saxena	*Opinion:* How easy is it to describe hard polynomials?: Technical Perspective	Communications of the ACM, 67(2), pg.100, Feb 2024; DOI [**Invited** by the editor]
74.	Meena Mahajan, Madhavan Mukund, Nitin Saxena	*Big Trends:* Research in theoretical computer science	Communications of the ACM, 62(11), 92-95, 2019; DOI [**Invited** by the editor]
75.	Nitin Saxena	Progress on polynomial identity testing-II	Perspectives in Computational Complexity. 2014, 131-146. [**Invited** by the editor]
76.	Nitin Saxena	Progress on Polynomial Identity Testing	Bulletin of the European Association for Theoretical Computer Science (EATCS), no.99, 49-79, Oct 2009. [**Invited** by the editor]

Development/ Patent

"Polynomial time deterministic method for testing primality of numbers".
with Manindra Agrawal and Neeraj Kayal.
2003-07-31: Priority to US10/631,346 (2008-03-18: US 7346637B2) (USA) (Granted)

Translational Work (R&D & Deployment)

1. Founding Dean of *Wadhwani School of AI & Intelligent Systems* (WSAIS, 2025--); leading a team that has won a long-term grant of US$35M from the Wadhwani Charitable Foundation. It constitutes one department (DIS) and five Centers (CDIS, C3i, CR, CAA, CAPO).
   Vision: To synchronize academia-industry collaboration in digital technology with India's national priorities over the next two decades, and to help national leaders define and operationalize a sensible national AI strategy.

2. Founding Coordinator of Center for Developing Intelligent Systems (CDIS, 2022--). CDIS is dedicated towards translational AI research, in particular, rapid development and prototyping of intelligent software systems, geared towards solving problems arising within the Indian ecosystem. Board of Governors/ IIT Kanpur approved CDIS to encourage AI+Software Development at large-scale; to nurture the local entrepreneurial spirit; and to train/maintain the required professionals and the compute power. The Center is executing projects (= products & services) worth ~Rs. 50 Crore. Here are the selected, collaboratory projects:
   i. "**ARF: AI Center of Excellence for Sustainable Cities-- Energy Vertical**", Ministry of Education, Grant-in-Aid, 2024-26. Fund: Rs. 6 Crore. (Consortium worth Rs. 350 Crore.)
   Product: Predictive algorithms as a Service: Design a forecasting model for Adani Total Gas Limited (ATGL). Forecast the industrial PNG demand based on alternate-fuel pricing. Design an algorithm for CNG logistics. Design a forecasting-model for Adani Electricity Mumbai Limited (AEML). Forecast the health of High-Tension-Cables.
   ii. "**Software Integration, Operations and Maintenance: of ICICI Foundation UP Digital Health Stack project**", ICICI CSR Grant of Dean of Resources & Alumni, 2024-26. Fund: Rs. 4 Crore.
   Product: Design of a public health information exchange system; Artificial intelligence for diagnosis and triage at scale; AI in disease surveillance.

iii. "**Technology to Integrate, Secure and Analyze Citizen Records (HPPA)**". (2022-25, worth ~Rs. 8 Crore.)
Product: Worked with the Haryana State Government to integrate data from across all their available databases to estimate income of Haryana citizens to determine their eligibility for public benefits services.

iv. "**Intelligent Grievance Management System (IGMS)**". (Duration 2021-24, worth ~Rs. 6 Crore.)
Product: The system comprehends the natural language grievances submitted by citizens; the system can classify, summarize and prioritize these grievances for faster action and follow up. It won a National Award for e-Governance in 2022. It is in 19 languages and is utilized by all central government departments since 2023.

v. "**Developing AI/ML for India and for the Social Good**". (Duration 2023-28, worth ~Rs. 3 Crore.)
Product: CDIS/IITK has taken upon itself the ambitious goal of developing a SaaS platform for common AI/ML use cases, serving AI/ML models specialized for the needs of India, and severely undercutting foreign competition on cost.

vi. "**Joint Development of Federated Learning Platform, Quality Database and Benchmarking System for Health AI**", National Health Authority. (Duration 2024-25, worth ~Rs. 1 Crore.)
Product: This collaboration combines IIT Kanpur's technological expertise with NHA's role in national health schemes, creating a platform for validating and deploying AI-driven health solutions in India.

vii. "**Data & Process Re-engineering for health insurance claims**", Department of ex-Servicemen Welfare, MoD. (Duration 2025-28, worth ~Rs. 3 Crore.)
Product: To develop the digital analytics pipeline for ECHS (Ex-Servicemen Contributory Health Scheme) claims processing.

viii. "**NHA Insurance bills fraud detection**", EY & National Health Authority. (Duration 2022-25, worth ~Rs. 10 Lakh.)
Product: It is being used internally by NHA since 2022, and processes over 50,000 claims every day. It has saved the NHA more than Rs 150cr since launch and has been selected as a case study at the MIT Sloan School.

ix. "**PFMS e-bills fraud detection**", Public Funds Management System; Controller General of Accounts, Ministry of Finance. (Duration 2025-26, worth ~Rs. 40 Lakh.)
Product: Detecting fraud in the e-bills; filling invoices based on a Language Model; verify the annual accounting.

x. "**Collaboratory Research Regarding Creation of Digital Open Library**", Ministry of Defense. (Duration 2024-29, worth ~Rs. 1 Crore.)
Product: The History Division and IIT Kanpur are collaborating to develop a digital library for military records.

xi. "**AI/ML Solutions for ACT-CORP**". (Duration 2023-25, worth ~Rs. 33 Lakh.)
Product: CDIS helped the company improve its efficiency by using AI-based – dynamic scheduling of the network engineers field tickets, and – prediction of the customers who are going to churn.

xii. "**Facial Recognition (National Testing Agency, Ernst & Young)**". (Duration 2023-25, worth ~Rs. 20 Lakh.)
Product: The project is aimed at hastening the identification of errors on admit cards and preventing impersonation at exam centres.

xiii. "**Paper2Bits: Tools for Office Automation, Pingala & IITK**". (Duration 2023-24, worth ~Rs. 12 Lakh.)
Product: Office automation of the essential offices; eliminating manual paper printing.

xiv. "**Real-time bed-availability and referral portal (RTBARP): MahaKumbh 2025**", UP State Government. (Duration 2024, worth ~Rs. 60 Lakh.)
Product: This project ensures smooth upstream and downstream referral of patients by facilitating clear communication between referring and referred hospitals.

xv. "**UP ACO (Uttar Pradesh Police)**". (2023--)
Product: The project developed tools to streamline the digitization process of FIR, the investigation, and the charge sheet documents.

xvi. "**Sashastra Seema Bal (SSB)**", a Central Armed Police Force under the Ministry of Home Affairs (MHA). (Duration 2025--, worth ~Rs. 40 Lakh.)
Product: AI Assistant for Admins. AI Assistant for Users. (Grievances Management System) GMS-e-Office Integration. Auto Categorization of complaints. Email Integration of complaints. Added-features: Voice to Text. Document to Text.

xvii. "**Road Safety Cell (RSC)**", Ministry of Road Transport and Highways (MoRTH). (2025)
Product: Collaboration in Developing AI layer for Predictive Analysis on eDAR (Electronic Detailed Accident Report) Portal.

xviii. "**UPSIDA**", Uttar Pradesh State Industrial Development Authority. (2025)
Product: Grievances System add-ons, integrated with social-media and email. Intelligent document analyses tools. CCTV and video analytics system to detect anomalous activities in industrial areas. (Duration 2025-.)

Research Funding

3. PI of the research project funded under DST/SERB *J.C.Bose Fellowship Award*. (Duration 2023-2028, worth ~Rs. 95 Lakh.)
4. PI of the project "Algebraic Circuits: Learning the inherent structure " funded under SERB *Core Research Grant* in Computer Sciences. (Duration 2021-2024, worth ~ Rs. 50 Lakh.)
5. PI of the project "Three problems in Algebraic Complexity Theory" funded under DST *SwarnaJayanti Fellowship Award* in Mathematical Sciences. (Duration 2015-2020, worth ~Rs. 69 Lakh.)
6. PI of the project "Rank concentration, Hitting-sets and Lower Bounds" funded under SERB *Fast Track Scheme for Young Scientist* in Mathematical Sciences. (Duration 2013-2016, worth ~Rs. 12.84 Lakh) Adjudged the `*Excellent*' grade on completion.
7. Research funding from Indian National Science Academy (INSA) with *Young Scientist Medal* 2015. (Not utilized yet.)

Contributions outside the Institute

1. Member, (founding) Editorial Board, TheoretiCS, (2021-27).
2. Member, Editorial Board of Indian Journal of Pure and Applied Mathematics (IJPAM) (2025--).
3. **Chair** of (Track A) 41st *FSTTCS 2020*.
4. Served on the **Program Committees** of---
   i. *CCC 2026* (41st Computational Complexity Conference)
   ii. *STOC 2024* (55th ACM Symposium on Theory of Computing)
   iii. *ISSAC 2023* (48th International Symposium on Symbolic and Algebraic Computation)
   iv. *CCC 2022* (37th Computational Complexity Conference)
   v. *ITCS 2022* (13th Innovations in Theoretical Computer Science)
   vi. *ISSAC 2020 Posters Committee* (45th International Symposium on Symbolic and Algebraic Computation),
   vii. *FOCS 2019 (*60th IEEE Symposium on Foundations of Computer Science),
   viii. *FCT 2019 (*22nd Symposium on Fundamentals of Computation Theory),

ix. *FSTTCS 2018 (*39th IARCS Annual Conference on Foundations of Software Technology and Theoretical Computer Science),
x. *STACS 2014* (31st Symposium on Theoretical Aspects of Computer Science),
xi. *CCC 2011* (26th IEEE Conference on Computational Complexity) and
xii. *CSR 2011* (6th International Computer Science Symposium in Russia).

5. Served on the **organizing committee**—
   i. Number Theory Conference on the 135th birth-year of Ramanujan *Feb-Mar-2023*,
   ii. 38th IARCS Annual Conference on Foundations of Software Technology and Theoretical Computer Science, *FSTTCS 2017*.
6. Served on the **Sectional Committee** for Mathematical Sciences in the Indian Academy of Sciences (2025--).
7. Served on the inter/national **project-review committees**:
   i. Special Invitee, Technical Program Committee, ANRF-ARG(Elec.E.C.E.) (2025).
   ii. Member, Technical Program Committee, ANRF-ARG(Math.Sci.) (2025-2028).
   iii. Member, Working Group for Cyber Security Division of MeitY (2025--).
   iv. Expert Committee, ANRF-PMECRG (2025-). ANRF-NPDF (2025-).
   v. INAE PEC for India-Taiwan S&T (2023--).
   vi. Science Education Panel [Academies: IASc, INSA & NASI] (2021--).
   vii. INSA-DST-INSPIRE Faculty Fellow Selection Committee (2021--).
   viii. Programme Advisory Committee, SERB-SUPRA Scheme (2019--).
   ix. Expert Committee, SERB-CRG (2023-).
   x. Expert Committee, SERB-SURE (2023-).
   xi. Expert Committee, SERB-SRG (2022-).
   xii. NBHM Research Projects Committee (2019--).
   xiii. NSF; ERC; Israel Science Foundation (ISF); French National Research Agency (ANR); German DFG; French-Austrian Agency ANR-FWF.
8. Served on the inter/national **award committees**:
   i. Member, Selection Committee for INAE Young Associate (Computer Engineering and Information Technology) (2025-).
   ii. Shanti Swarup Bhatnagar Award (SSB) -Mathematical Sciences- Committee (confidential).
   iii. Haryana Vigyan Ratna, Government of Haryana (confidential).
9. Served on the **selection/tenure committees**:
   i. Faculty Selection Committee – IITB, IITM, IIT-BHU, IIT-ISM, IITI, IMSc, NISER, DIAT, HBTU, LNMIIT, PSIT, Thapar Institute, NIT-W, Allahabad University, Gati Shakti Vishwavidyalaya (GSV).
   ii. University of Colorado Boulder ; Union College Schenectady, NY.
   iii. DRDO Scientist Selections (2023).
   iv. HPPA Selections for Center for AI, Chandigarh (2023--).
   v. Faculty Selections, Bihar Public Service Commission, Patna (2021).
10. Served on the department-/curriculum-**review committees**:
    i. CSE Department Review, HBTU (2022), IIT-ISM Dhanbad (2023).
    ii. Academic Council, Chennai Mathematics Institute (2022--25).
    iii. Board of Studies, Chankaya University (2024).
11. Served on the defense committees:
    i. **Habilitation** defense committee -- Herve Fournier (University Paris-Diderot, France, 2014).
    ii. External Member, **PhD** defense committee -- Daniel Loebenberger (BIT-Uni.Bonn, Germany, 2012) ; Bruno Grenet (ENS Lyon, France, 2012) ; Ankit Gupta (CMI, India, 2015) ; Nikhil Gupta (IISc, 2023) ; Dhara Thakkar (IITGn, 2024) ; Sanghamitra Mishra (IITP, 2025) ; Roshan Raj (IITB, 2025).
    iii. TIFR, Tel-Aviv, NIT-Allahabad (with committees confidential).
12. Commissioner, **62nd IMO'21** (International Mathematical Olympiad), appointed by the IMO Board.
13. **Reviewer** for journals: Acta.Arithmetica, Annals.Maths, Combinatorica, Comp.Complex., Fundamenta.Informaticae, IEEE.T.Inform.Theory, ACM.Trans.Comp.Theory, Inform.Process.Lett., J.Complexity, Math.Comput., SIAM.J.Comp., J.Symb.Comput., Theory.of.Computing, TCS, ToCT, TheoretiCS, JRMS, JNT, Integers, Proc.Math.Sc.
14. **Reviewer** for conferences: ANTS, CCC, CSR, CALDAM, ESA, FCT, FOCS, FSTTCS, ICALP, ITCS, ISAAC, ISSAC, MFCS, RANDOM, SODA, SPAA, STACS, STOC.

Contributions to the institute

1. **Dean**, Wadhwani School of AI & Intelligent Systems (2025-28).
2. **Coordinator**, Center for Developing Intelligent Systems (CDIS), (2022-28).
3. **Chair**, UnderGraduate Academic Review Committee (2018-2021).
4. **Lead**, Energy vertical (with ATGL/AEML/AGEL), ARF/ AI CoE for Sustainable Cities (2024--).
5. **Convener**, IITK Steering Committee (to found) School of AI & Intelligent Systems (2024--).
6. **Chair**, IITK REACH'20 (Research Challenges) Symposium; Member in 2024.
7. Served in the institute committees:
    i. **Chair**, Users' Committee for Construction of the building for Wadhwani School of AI & IS, 2025.
    ii. **Chair**, Revision of purchase procedure through non-government grants received at IIT Kanpur, 2025.
    iii. Director's Advisory Council (DAC), 2025-.
    iv. Committee to define guidelines for career progression in Research Track, 2024.
    v. (Convener) Marketing, Fundraising, & Special Events, Inter-IIT Sports Meet, 2024.
    vi. Grievances Redressal Committee for Student Elections, 2022-23.
    vii. Senate Education Policy Committee, 2023.
    viii. Academics Ethics Cell, 2023-25.
    ix. Lecture Hall Requirements Committee, 2023.
    x. Committee to explore IITK Campus Abroad, 2022.
    xi. Institute Strategy and Planning Committee (2022).
    xii. Senate Honorary Degree Committee (2022-24).
    xiii. Security Advisory & Executive Committee, IITK (2017-19, 2019-21).
    xiv. Festival Advisory Committee, Techkriti, 2022-23, 2016-18 (IITK Student's Technical Festival).
    xv. DoRA Advisory Group (2014-15).
    xvi. IITK Website Task Force (2014-16).
    xvii. MSI/CSE Seminar Coordinator, and Math.Sci.Initiative's co-PI (2013-15).
8. Served on the department committees:
    i. Convener, CSE DUGC (Jan'16--Aug'18).
    ii. Convener, CSE Faculty Meeting (2015-17).
    iii. Convener, CSE Student Placement (2015-16).
    iv. Convener, PhD Reformation Committee (2018).
    v. CSE PG Admissions Committee (2016--).
    vi. CSE DPGC/ DUGC Counseling Advisor (2014--).
    vii. Furnishings Committee for the Motwani building (2014).
9. IR for multiple GATE/ JEE Advance examinations.

Other Interests

- Languages: *Fluent*: Hindi (native), English.
Basic: German (reading better than speaking) ; French (only reading) ; Dutch (only reading).

- Interests:
Classical Piano (*basic -- intermediate*).
Movies, Non-fiction (Philosophy, Psychology), High fantasy, Swimming, Travel.

(*ns*)
Aug-2025