

# Dr. Ajit Kumar --- A Brief Biodata

**Personal Webpage:** <http://ajitmathsoft.wordpress.com/>

## Current Affiliation:

Professor & Head

Department of Mathematics, Institute of Chemical Technology, Mumbai, INDIA

**Contact:** [a.kumar@ictmumbai.edu.in](mailto:a.kumar@ictmumbai.edu.in), [ajit72@gmail.com](mailto:ajit72@gmail.com), 022 3361 2681 (O), 9969031202 (M)

## Education

- Ph.D. in Mathematics, University of Mumbai (2002)
- B.Sc. in Mathematics, Patna University (1995)
- M.Sc. in Mathematics, University of Mumbai (1997)
- **Thesis** (Differential Geometry) – Some problems in Geometry and Analysis under the guidance of Prof. S. Kumaresan. I was NBHM research fellow during my Ph.D.

## Previous Appointments:

- Asst. Prof., Mathematical Sciences Foundations, St. Stephen's College, Delhi. (2003-2004)
- Lecturer, St. Xaviers College, Mumbai (2002-2003)

**Current Area of Research:** Optimization Techniques, Data Analytics, Mathematical Pedagogy.

**Guided 3 students for Ph. D. and 22 Masters projects.**

## Publication:

1. "Numerical methods in LATEX using Lua" with Chetan Shirore, The Electronic Journal of Mathematics and Technology, 2024, Volume 18, Number 1, ISSN 1933-2823, p. 29-36.
2. "*Linear Algebra Computational Tool for LaTeX*", with Chetan Shirore, Proceedings of 28th Asian Technology Conference in Mathematics, 2023, p. 33-47.
3. "*Applications of Lua for LaTeX Documents*" with Chetan Shirore, Proceedings of 28th Asian Technology Conference in Mathematics 2023, p. 237-246.
4. "The truthable Lua Package" with Chetan Shirore, TUGBoat ( The Communication of TeX User Group) Journal, 2022, Volume 43, Issue 2, p. 172-175, DOI: 10.47397/tb/43-2/tb134shirore-luatruthtable
5. "A Study of Indian Stock Market using Matrix Variate Dynamic Model," with P. Dwivedi, 2020 IEEE 5th International Conference on Computing Communication and Automation (ICCCA), Greater Noida, India, 2020, pp. 286-291, doi: 10.1109/ICCCA49541.2020.9250845.
6. Sentiment Analysis of Indian Stock Market using Linear Dynamical System", with P. Dwivedi, 2020 IEEE International Conference on Computing, Power and Communication Technologies (GUCON), Greater Noida, India, 2020, pp. 629-634, doi: 10.1109/GUCON48875.2020.9231246.
7. Optimizing Generalized Capacitated Vehicle Routing Problem Using Augmented Savings Algorithm", with Barnali Saha and Kamlesh Sutar, Computational Intelligence in Data Mining, Springer, Volume 990, pp 527-54, 2019.
8. Interdependence of Returns on Bombay Stock Exchange Indices", with Prabhat G. Dwivedi, International Journal of Engineering Technology Science and Research, ISSN 2394 – 3386, Vol. 4, Issue 8, Aug. 2017.
9. "Optimizing Heterogeneous Fleet Vehicle Routing Problem", with Barnali Saha, International Journal of Advance Research in Science and Engineering, Vol 5, Issue No 08, Aug 2016, ISSN-2319-8354, p. 542-551.

10. "Gender Classification Using Facial Image in R-Language" with Manasi Khanolkar, JMSG, Vol 2, Issue 2, Oct 16, ISBN No. 2454 8367, p. 106-113
11. "Application of Progressive Discovery as a Teaching Aid Using MathDisk" with Sang-Gu Lee and Sharfudeen Ashraf, Electronic Journal of Mathematics and Technology, Volume 10, Number 1, ISSN 1933-2823, page 44-54 (2016).
12. "OPEN SOURCE SOFTWARE, ITS USE AND RELEVANCE TO SCHOOL EDUCATION" published in the proceeding of 7th Conference on Technology & Innovation in Mathematics Education held during 4th-7th December 2015. ISBN No. 978-81-985591-8-8.
13. Enhancing Student Comprehension of Mathematics with MathDisk, jointly with Mohamed Jaffarali, proceeding of The Second International Conference on Mathematics, and Technology in Mathematics Education 2013, March 4-6, 2013, Phnom Penh, Cambodia, p. 75-79.
14. SAGE: Software for Algebra Geometry and Experimentation, proceeding of National Seminar on Uses of Technology in Math Education, SSCE, Shimurali, WB, Sept. 11-12, 2012, p. 38-48, ISBN No. 978-81-922902-4-9
15. Educational Interfaces between Mathematics and Industry in India AND Use of Technology in Mathematics Education in India, Proceeding of International conference on Educational Interfaces Between Mathematics and Industry" (An ICMI-ICIAM International Study), Oct. 11-15, 2010 at Lisbon, Portugal, Page no. 357-367, ISBN No. 10:1-933223-64-2, 13:978-1-933223-64-2, COMAP, Inc USA
16. Use of Mathematical Software for Teaching and Learning Mathematics, with S. Kumaresan, Proceedings of 11th International Congress on Mathematics Education, July 6-13, 2008, Mexico. [http://www.mathunion.org/fileadmin/ICMI/files/About\\_ICMI/Publications\\_about\\_ICMI/ICME\\_11/Kumar\\_Kumaresan.pdf](http://www.mathunion.org/fileadmin/ICMI/files/About_ICMI/Publications_about_ICMI/ICME_11/Kumar_Kumaresan.pdf)
17. Use of Computer Algebra Systems in Mathematics Teaching Proceeding of Technology and Innovation in Mathematics Education (TIME 2007), IITB, 2007, p. 69-76, ISBN No:978-81-905591-2-6
18. Classification of Surfaces Via Morse Theory, Expositiones Mathematicae, 18, (2000, 037-074) with S. Kumaresan and Abhijit Champanerkar.

## Books Authored

- Online book on "Linear Algebra with SageMath: A Gentle Introduction"  
<https://ajitbkp.github.io/LinAlg-SageBook/frontmatter.html>
- "Group Theory -- An Expedition with SageMath" with Vikas Bist, Narosa Publishing House, New Delhi.
- "A Foundation Course in Mathematics" with S. Kumaresan & B.K.Sarma, Narosa, 2017.
- "A Basic Course in Real Analysis" with S. Kumaresan, CRC Press (2014)
- "Calculus with Sage" with S. G. Lee and others, KyungMoon Publication, S. Korea (2014)
- "Linear Algebra with Sage", A Free Online book, with S. G. Lee and others. (online)
- Written 7 book chapters

## Invited Talks:

Given several invited talks at national and international level. (A list of few of these talks is available on my website)

- Invited talk at the 28th Asian Technology Conference in Mathematics held at Pattaya, Bangkok during Dec. 10-13, 2023.

- Invited regular lecture at the International Congress on Mathematics Education (ICME-2008), Mexico
- Talk in Educational Interfaces between Mathematics and Industry, 2010, Lisbon,
- Member of Indian Delegation at ICME 2012, Seoul.
- Invited talk at the Asian Mathematical Conference (MSC) 2013, Busan S. Korea
- Talk at International Linear Algebra Society (ILAS) 2014, South Korea
- Invited talk at SUKEN, Tokyo, 2009

### **Workshops and Conference** (partial details are available on my personal website)

- Conducted several workshops & conferences for teachers and students over the years.
- Have been invited as a resource person in numerous workshops for teachers across the country.
- Attended several national and international conferences.

### **Expertise in Mathematical Software**

- Prolific user of Mathematical Software, (viz. Sage, Python, R, Mathematica, Geogebra, SciLab, etc) for last several years.
- Given several courses using these software and has also designed curriculum using them. Given invited talks on these topics at several national and international forums:

### **MTTS Programme:**

- Managing Trustee, MTTS Trust since 2016.
- Member of the National Core committee of the Mathematics Training and Talent Search (MTTS) and Programme and Pedagogical Training Programme for Mathematics Teachers (PTMT) Programme. These Programmes are funded by the National Board of Higher Mathematics (NBHM), an apex body of the Department of Atomic Energy (DAE), Govt. Of India since 1993.
- I have been associated with this MTTS programme in various capacity for last several years.

### **Member of BOS and Designing Curriculum:**

I have been part of designing Syllabus many courses and have been member of Board of Studies of many institutions.