Curriculum vitae

Personal Information

FIRST NAME / SURNAME	Shrohan Mohapatra
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EMAIL	smohapatra@umass.edu sm32@iitbbs.ac.in shrohan2017@gmail.com
NATIONALITY	Indian
DATE OF BIRTH	21.11.1996
GENDER	Male (he/him)
GITHUB PROFILE	ShrohanMohapatra (https://github.com/ShrohanMohapatra)
GOOGLE SCHOLAR PROFILE	Shrohan Mohapatra (https://scholar.google.com/citations?user=ZO-61AsAAAAJ&hl=en)
LINKEDIN PROFILE	SHROHAN MOHAPATRA (https://www.linkedin.com/in/shrohan-mohapatra-9635a912a/)

Education and Training

DATES	2012 - 2013
QUALIFICATION AWARDED	Secondary School Certificate (Class X)
PRINCIPAL STUDIES	Science, Mathematics, English, Social Science, Hindi (2nd language)
EXAMINATION TAKEN	All India Senior School Certificate Examination
EXAMINING BODY	Central Board of Secondary Examination
MARKS ATTAINED	95 % (CGPA - 10)
INSTITUTION	Delhi Public School Kalinga

DATES	2014-2015
QUALIFICATION AWARDED	Senior Secondary School Certificate (Class XII)
PRINCIPAL STUDIES	Physics, Chemistry, Mathematics, Computer Science, English
EXAMINATION TAKEN	All India Secondary School Examination
EXAMINING BODY	Central Board of Secondary Examination
MARKS ATTAINED	94.8 %
INSTITUTION	Delhi Public School Kalinga

Curriculum vitae

Education and Training

DATES 2015-2019

QUALIFICATION AWARDED Bachelors of Technology (Honours) in Computer Science and Engineering

CPGA 9.67 (on a scale of 10, recipient of the President of India's Gold Medal)

INSTITUTION Indian Institute of Technology Bhubaneswar

DATES 2019-2025

QUALIFICATION AWARDED Doctor of Philosophy (Physics)

STATUS Ongoing

RESEARCH INTERESTS Low Reynolds-number fluid mechanics, fluid-bubble interactions, Navier-Stokes equations

INSTITUTION University of Massachusetts, Amherst

Research Experience (Publications)

1. Bhamidipati, Chandrasekhar; Mohapatra, Shrohan (2019), *A note on circular geodesics and phase transitions of black holes*. Physics Letters B, 791(), 367–374.

2. Sandip Mahish, Shrohan Mohapatra, Karunava Sil, Chandrasekhar Bhamidipati (2021), *A note on size-momentum correspondence and chaos*, Physics Letters B, Volume 823

3. Santhosh Kelathodi Kumaran, Shrohan Mohapatra, Debi Prosad Dogra, Partha Pratim Roy, Byung-Gyu Kim (2019), *Computer Vision-guided Intelligent Traffic Signaling for Isolated Intersections*, Expert Systems With Applications

3. Pradhan A., Sethi K., Mohapatra S., Bera P. (2019) *Distributed Multi-authority Attribute-Based Encryption Using Cellular Automata*. In: Mu Y., Deng R., Huang X. (eds) Cryptology and Network Security. CANS 2019. Lecture Notes in Computer Science, vol 11829.

Research Experience (contd.)

4. Mohapatra, S. (2018). A new quadratic-time number-theoretic algorithm to solve matrix multiplication problem. *arXiv preprint arXiv:1806.03701*.

5. Mohapatra, S. (2019). Novel applications of cellular automata in computing and computational astrophysics. Undergraduate Thesis (Bachelors of Technology in Computer Science and Engineering), Indian Institute of Technology Bhubaneswar, India.

6. Shrohan Mohapatra. (2019). *Automated symbolic geodesics classification in spherically symmetrical black holes using first order cellular automata*. Zenodo. https://doi.org/10.5281/zenodo.3346086

7. Shrohan Mohapatra. (2020). Input domain modeling using Grobner bases and Lie-algebraic resolutions and implications for P vs NP. Zenodo. https://doi.org/10.5281/zenodo.3996707

8. Shrohan Mohapatra. (2020). *Automated Lie-algebraic input space partitioning using first-order two-dimensional cellular automata*. Zenodo. https://doi.org/10.5281/zenodo.3880404

9. Shrohan Mohapatra. (2020). *A beginner's guide to weak gravity conjecture*. Zenodo. https://doi.org/10.5281/zenodo.3996720

10. Shrohan Mohapatra. (2020). *Computational determinacy of cellular automata.* Zenodo. https://doi.org/10.5281/zenodo.3755211

11. Shrohan Mohapatra, Benjamin Davidovitch, *Curvature-based fluctuations of a thin-sheet floating on a driven liquid surface,* (in progress)

12. Shrohan Mohapatra (2022), *Emerging irregularities in the incompressible viscous flows by local advective vorticities*, (in progress)

Ongoing research and readings for learning

1. Richardson, S. (1968). Two-dimensional bubbles in slow viscous flows. *Journal of Fluid Mechanics, 33*(3), 475-493. doi:10.1017/S0022112068001461
2. Mansfield, E. (1991), Differential Gröbner Bases, *PhD Thesis*, Univ. of Sydney.
3. Esterov, A., & Gusev, G. (2016). Multivariate Abel–Ruffini. *Mathematische Annalen*, *365*(3), 1091-1110.
4. van der Put, M. (2005). Galois theory and algorithms for linear differential equations. *Journal of symbolic computation*, *39*(3-4), 451-463.
5. Lei, J. (2006). Nonlinear differential Galois theory. *arXiv preprint math/0608492*.
6. Geddes, K. O., Czapor, S. R., & Labahn, G. (1992). *Algorithms for computer algebra*. Springer Science & Business Media.
7. Cox, D., Little, J., & OShea, D. (2013). *Ideals, varieties, and algorithms: an introduction to computational algebraic geometry and commutative algebra*. Springer Science & Business Media.
8. Joseph, D., Nelson, J., Renardy, M., & Renardy, Y. (1991). Two-dimensional cusped interfaces. *Journal of Fluid Mechanics, 223*, 383-409
9. Kardar, Mehran; Parisi, Giorgio; Zhang, Yi-Cheng (1986). *Dynamic Scaling of Growing Interfaces. , 56(9), 889–892.* doi:10.1103/physrevlett.56.889
10. Forster, D., Nelson, D. R., & Stephen, M. J. (1977). Large-distance and long-time properties of a randomly stirred fluid. *Physical Review A*, *16*(2), 732.
11. Landau, L. D., Lifshitz, E. M. (2013). *Fluid Mechanics: Landau and Lifshitz: Course of Theoretical Physics, Volume 6*. Netherlands: Elsevier Science
12. Lifshitz, E. M. et al. (1986) *Fluid Mechanics: Landau and Lifshitz: Theory of Elasticity, Volume 7*. Germany: Elsevier Science
13. Y. Pala, M. O. Ertas, "A New Analytical Method for Solving General Riccati Equation", *Universal Journal of Applied Mathematics* 5(2): 11-16, (2017)
14. O. Ladyzhenskaya, The Mathematical Theory of Viscous Incompressible Flows (2nd edition), *Gordon and Breach,* New York, 1969

Skills and Competences

PROGRAMMING SKILLS

C/C++, Java, Python, Wolfram, Dafny, Promela, FreeFEM++, Assembly language for x86

SOFTWARE SKILLS

Sympy (on Anaconda, IPython,, Jupyter etc.), Cadabra, Mathematica, MATLAB, COMSOL Multiphysics, FreeFEM, SfePy, Logisim, Dafny, Promela, LaTeX

SPECIAL PACKAGES IN PYTHON EXPLORED

Sympy, SfePy, Unittest, Scipy, Numpy, Tensorflow, PySMT,

OPERATING SYSTEMS

Mac OS High Sierra, Windows 10, Ubuntu 16.0

CURRICULAR COURSES OF IMPORTANCE

Introduction to Ocean Dynamics
Advances in Nano science and Nanotechnology
Engineering Mechanics
Fundamentals of Weather and Climate Sciences
Introduction to Electronics (Analog Electronics)
Digital Electronics
Combinatorics, Probability and Statistics
Design and Analysis of Algorithms
Formal Languages and Automata Theory
Compiler Design
Software Testing and Verification
Cryptography
Classical Mechanics
Intermediate Quantum Mechanics (Parts I and II)
Statistical Physics
Classical Electrodynamics
Quantum Field Theory I
General Relativity
Independent Study: Introduction to String Theory
Independent Study: The Weak Gravity Conjecture
Introduction to Soft Matter Physics
Elements of Computational Modelling and Numerical Simulation (Polymer Science and Engineering)
Topics in Continuum Physics (Theory of Elasticity and Fluid Dynamics)
Advanced Statistical Physics (Critical Phenomena and

Renormalization Groups)

Additional Information

ACADEMIC ACHIEVEMENTS

Awarded National Talent Search Examination Scholarship of INR 24000 from 2013-2019

Qualified Joint Entrance Examination (Mains and Advanced) with an All India Rank 4773 (among 117238 candidates)

Student with the highest GPA of the 2015-2019 batch of Bachelors of Technology at the Indian Institute of Technology Bhubaneswar, recipient of the President's Gold Medal

OTHER IMPORTANT ACTIVITIES

Attended the Wolfram Technology Conference 2017 in Bengaluru India.

Worked for Rapido cab taxi app in Bengaluru from May 2017 to July 2017 as a summer internee

Been a part of the Indian Youth Delegation to China in July 2018

Attended the APS March Meeting for the Academic Years 2021 and 2022, presided sessions at the Soft Matter Journal Club, have been a teaching assistant to different courses at the University of Massachusetts

References

Prof. Benjamin Davidovitch
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References

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