Ashish Pandey

Curriculum Vitae

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My Webpage

Employment

2018–present **Assistant Professor, Department of Mathematics**, *Indraprastha Institute of Information Technology (IIIT)*, Delhi, India.

Education

2012–2018 **PhD, Mathematics**, *Cornell University & University of Illinois at Urbana-Champaign (UIUC)*, USA, Modulational instability in some shallow water wave models.

2007–2012 **Integrated Master of Science (M.Sc.) in Mathematics**, *National Institute of Science Education & Research (NISER)*, Bhubaneswar, India.

Research Interests

Partial Differential Equations, *Stability of solutions of water wave models*.

Applications of Machine Learning, *Prediction problems of morbidities in neonates, Prediction problems of characteristics of tropical cyclones*.

Theoretical Machine Learning, *Understanding role of activation functions in neural networks*.

Game Theory, *Double auction mechanisms for land assembly*.

Number Theory, *Diffraction and dynamical spectra of generalized visible lattice points*.

Publications

Partial Differential Equations

2021 Bhavna, Atul Kumar, and **Ashish Kumar Pandey**. Transverse instability in ostrovsky equation. *Submitted for publication*, 2021.

2021 Bhavna, Atul Kumar, and **Ashish Kumar Pandey**. Transverse instability in generalized kadomtsev-petviashvili equation. *Submitted for publication*, 2021.

2019 **Ashish Kumar Pandey**. The effects of surface tension on modulational instability in full-dispersion water-wave models. ***European Journal of Mechanics-B/Fluids***, volume 77, pages 177–182. Elsevier, 2019.

2019 Vera Mikyoung Hur and **Ashish Kumar Pandey**. Modulational instability in a full-dispersion shallow water model. ***Studies in Applied Mathematics***, volume 142, pages 3–47. Wiley Online Library, 2019.

2017 Vera Mikyoung Hur and **Ashish Kumar Pandey**. Modulational instability in the full-dispersion camassa–holm equation. ***Proceedings of the Royal Society A: Mathematical, Physical and Engineering Sciences***, volume 473, page 20170153. The Royal Society Publishing, 2017.

2016 Vera Mikyoung Hur and **Ashish Kumar Pandey**. Modulational instability in nonlinear nonlocal equations of regularized long wave type. ***Physica D: Nonlinear Phenomena***, volume 325, pages 98–112. Elsevier, 2016.

Applications of Machine Learning

2021 Harpreet Singh, Satoshi Kusuda, Ryan M McAdams, Shubham Gupta, Jayant Kalra, Ravneet Kaur, Ritu Das, Saket Anand, **Ashish Kumar Pandey**, Su Jin Cho, et al. Machine learning-based automatic classification of video recorded neonatal manipulations and associated physiological parameters: A feasibility study. ***Children***, volume 8, page 1. Multidisciplinary Digital Publishing Institute, 2021.

2021 Harpreet Singh, Su Jin Cho, Shubham Gupta, Ravneet Kaur, S Sunidhi, Satish Saluja, **Ashish Kumar Pandey**, Mihoko V Bennett, Henry C Lee, Ritu Das, et al. Designing a bed-side system for predicting length of stay in a neonatal intensive care unit. ***Scientific reports***, volume 11, pages 1–13. Nature Publishing Group, 2021.

2021 Sandeep Kumar, Koushik Biswas, and **Ashish Kumar Pandey**. Track prediction of tropical cyclones using long short-term memory network. In ***2021 IEEE 11th Annual Computing and Communication Workshop and Conference (CCWC)***, pages 0251–0257. IEEE, 2021.

2021 Sandeep Kumar, Koushik Biswas, and **Ashish Kumar Pandey**. Prediction of landfall intensity, location, and time of a tropical cyclone. In ***Proceedings of the AAAI Conference on Artificial Intelligence***, 2021.

2021 Sandeep Kumar, Koushik Biswas, and **Ashish Kumar Pandey**. Predicting landfall's location and time of a tropical cyclone using reanalysis data. *arXiv preprint arXiv:2103.16108*, 2021.

2018 Harpreet Singh, Ravneet Kaur, Abhilash Gangadharan, **Ashish Kumar Pandey**, Ashray Manur, Yao Sun, Satish Saluja, Shubham Gupta, Jonathan P Palma, and Praveen Kumar. Neo-bedside monitoring device for integrated neonatal intensive care unit (inicu). ***IEEE Access***, volume 7, pages 7803–7813. IEEE, 2018.

Theoretical Machine Learning

2020 Koushik Biswas, Sandeep Kumar, Shilpak Banerjee, and **Ashish Kumar Pandey**. Tanhsoft–a family of activation functions combining tanh and softplus. *arXiv preprint arXiv:2009.03863*, 2020.

2020 Koushik Biswas, Sandeep Kumar, Shilpak Banerjee, and **Ashish Kumar Pandey**. Eis–a family of activation functions combining exponential, isru, and softplus. *arXiv preprint arXiv:2009.13501*, 2020.

Game Theory

2021 Rakesh Chaturvedi and **Ashish Kumar Pandey**. A double auction mechanism for land assembly. *Submitted for publication*, 2021.

Number Theory

2021 Sneha Chaubey and **Ashish Kumar Pandey**. Diffraction and dynamical spectra of generalized visible lattice points. *In preparation*, 2021.

2020 Sneha Chaubey and **Ashish Kumar Pandey**. On density of visible lattice points along polynomials. *Submitted for publication*, 2020.

Research Grants

2020–2022 **Start-up Research Grant**, *Science & Engineering Research Board, Department of Science and Technology, Government of India*, Stability of periodic travelling waves of nonlinear PDEs modelling waves on the water surface, USD 24,563.

2018–2023 **Research Initiation Grant**, *IIIT Delhi, India*, Support for outstanding young researchers, USD 8,187.

Teaching Experiences

Calculus, *200-level course at UIUC*, as a teaching assistant, six semesters.

Foundations of mathematics, *100-level course at UIUC*, as an instructor, one semester.

Complex Analysis, *500-level course at IIIT*, as an instructor, three semesters.

Introduction to Functional Analysis, *500-level course at IIIT*, as an instructor, two semesters.

Differential Equations, *200-level course at IIIT*, as an instructor, one semester.

Mentoring Experiences

2019–present **PhD students**, *Koushik Biswas (Computer Science), Sandeep Kumar (Computer Science), Atul Kumar (Mathematics), Bhavna (Mathematics).*

2018–2019 **M.Tech. Thesis supervised**, *Sunidhi, Tanya Singh (Computational Biology).*

2019 **Summer Internship**, *Samikchha Singh (Machine Learning).*

Services

2019–present **Faculty-in Charge**, *Sports*, IIIT Delhi.

2019–present **Chairperson**, *PhD Admissions Committee*, Department of Mathematics, IIIT Delhi.

2020–present **Chairperson**, *PG Committee*, Department of Mathematics, IIIT Delhi.

Awards & Fellowship

2013–2016 **Excellent Teacher Award**, *Selection for the UIUC List of Teachers Ranked as Excellent: Fall 2013, Spring 2014, Fall 2015.*

2012 **Best Dissertation Award**, *Integrated M.Sc., NISER, India.*

2012 **Best Performance Award**, *Integrated M.Sc., NISER, India.*

2007–2012 **INSPIRE Fellowship**, *Government of India.*

Invited Talks

2021 **Virtual Workshop on collating Mathematics Resources for Teachers in Higher Education**, *NIEPA India.*

2020 **Mathematics Seminar Series**, *IIIT Delhi.*

2019 **Mathematics Colloquium**, *Gargi College & Maitreyi College, University of Delhi.*

2019 **Faculty Development Program on Biomathematics**, *Shivaji College & Hansraj College, University of Delhi.*

2018 **Differential Equations Seminar**, *University of Wisconsin, Madison.*

2018 **Mathematics Seminar**, *Purdue University.*

2017 **Joint Mathematics Meeting**, *Atlanta.*

2016 **Computational and Applied Mathematics seminar**, *University of Kansas, Lawrence.*

2016 **Harmonic Analysis and Differential Equations Seminar**, *UIUC.*

2016 **Annual Meeting of the Illinois Section of the MAA**, *Illinois College.*

2016 **SIAM Conference on Nonlinear Waves and Coherent Structures**, *Philadelphia.*

2016 **Gene Golub SIAM Summer School**, *Drexel University.*

2016 **Analysis of Partial Differential Equations Conference**, *Boston University.*

2015 **KUMU PDE, Dynamical Systems and Applications**, *University of Kansas, Lawrence.*