Shreya Ghosh, Ph.D.

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🌐 https://shreghosh.github.io/   G Google Scholar
📄 PhD & Postdoc Research Summary   📄 Teaching Statement   📄 Research Statement

Employment History

Dec, 2023 – Present	🔖	**Assistant Professor.** Indian Institute of Technology (IIT) Bhubaneswar, India.
2021 – Nov, 2023	🔖	**Postdoctoral Researcher.** The Pennsylvania State University, State College, USA.
2020 – 2021	🔖	**Senior Research Associate.** Indian Institute of Technology Kharagpur, India.

Education

2016 – 2021	🔖	**Ph.D., Computer Science & Engg., Indian Institute of Technology (IIT) Kharagpur.** Thesis title: *Semantic Analysis Of Trajectory Traces To Explore Human Movement Behaviour.* Thesis submission: *Dec, 2020.* PhD Awarded: *Dec, 2021.*
2015 – 2016	🔖	**MS (by research). Computer Science & Engg., IIT Kharagpur.** CGPA: 9.15/10 *(Selected and converted to Direct PhD in 2016)*
2011 – 2015	🔖	**BTech. Computer Science & Engg., Indian Institute of Engineering Science and Technology, Shibpur (IIEST), India.** CGPA: 8.90/10

Research Publications (Selected*) [Full Publication List: Google Scholar]

● **Total Journals (15)** ● **Conference Papers (25+)** ● **Patent (1)** ● **Authored book (1)** ● **Google Scholar Citations (640+)**

Authored Book

B1 **Machine Learning Techniques for Spatio-temporal Mobility Data.**
Shreya Ghosh and Prasenjit Mitra. Cambridge University Press (in preparation, to be published in December 2024)
[Proposal] [Acceptance]

Book Chapters

C1 **Mobility driven Cloud-Fog-Edge Framework for Location-aware Services: A Comprehensive Review**
Shreya Ghosh, Soumya K. Ghosh. *Introduction to Mobile Edge Computing, Mobile Edge Computing (MEC)*, Springer, USA, pp. 229-249. [PDF]

C2 **Dynamic Voltage and Frequency Scaling Approach for Processing Spatio-Temporal Queries in Mobile Environment**
Shreya Ghosh, Jaydeep Das. *Green Mobile Cloud Computing*, Springer, pp. 185-199. [PDF]

C3 **Geospatial Green Mobile Edge Computing: Challenges, Solutions and Future Directions**
Jaydeep Das and *Shreya Ghosh*. *Green Mobile Cloud Computing*, Springer, pp. 171-184. [PDF]

Refereed journal articles (◇ Joint primary author, ‡ Corresponding author.)

J1 **Mobilytics: Mobility Analytics Framework for Transferring Semantic Knowledge**
Shreya Ghosh‡, Soumya K. Ghosh, Sajal K Das, and Prasenjit Mitra. IEEE Transactions on Mobile Computing, July 2024. [Accepted, to appear] **[I.F.: 7.9]**[PDF]

J2 **FEEL: FEderated LEarning Framework for ELderly Healthcare using Edge-IoMT**
Shreya Ghosh‡, and Soumya K. Ghosh. IEEE Transactions on Computational Social Systems, Page(s): 1800 - 1809, Volume: 10, Issue: 4, August 2023. **[I.F.: 5.0]** [PDF]

J3 **Mobi-IoST: Mobility-aware Cloud-Fog-Edge-IoT Collaborative Framework for Time-Critical Applications**
Shreya Ghosh‡, Anwesha Mukherjee, Soumya K. Ghosh, and Rajkumar Buyya. IEEE Transactions on Network Science and Engineering (TNSE), Page(s): 2271-2285, Volume 7, Issue: 4, IEEE 2020 **[I.F.: 6.6]** [PDF]

J4 **LYRIC: Deadline and Budget Aware Spatio-Temporal Query Processing in Cloud**
Jaydeep Das◇, *Shreya Ghosh*◇, Soumya K. Ghosh and Rajkumar Buyya. IEEE Transactions on Services Computing, Page(s): 2869 - 2882, Volume: 15, Issue: 5, 01 Sept.- Oct. 2022 **[I.F.: 8.1]** [PDF]

J5 **MCG: Mobility-aware Computation Offloading in Edge using Weighted Majority Game**
Anwesha Mukherjee, *Shreya Ghosh*‡, Debashis De, and Soumya K. Ghosh. IEEE Transactions on Network Science and Engineering, Page(s): 4310 - 4321, Volume: 9, Issue: 6, 01 Nov.-Dec. 2022. **[I.F.: 6.6]** [PDF]

J6 **MARIO: A spatio-temporal data mining framework on Google Cloud to explore mobility dynamics from taxi trajectories.**
Shreya Ghosh‡, Soumya K. Ghosh and Rajkumar Buyya. Journal of Network and Computer Applications (JNCA), ISSN: 1084-8045, Elsevier, Amsterdam, The Netherlands Press, 2020. **[I.F.: 8.7]** [PDF]

Fully Referenced Conference Papers [Ranking: CORE conference ranking 2023]

C1 **Clock Against Chaos: Dynamic Assessment and Temporal Intervention for Reducing Misinformation Propagation**
Shreya Ghosh, Prasenjit Mitra and Preslav Nakov. In Proceedings of the 18th International AAAI Conference on Web and Social Media, vol. 18, pp. 462-473. 2024. **[A rank]** [PDF]

C2 **Bridging Semantics: Mobility Analytics Framework for Knowledge Transfer**
Shreya Ghosh, and Prasenjit Mitra. In Proceedings of the 2024 SIAM International Conference on Data Mining (SDM) (pp. 607-615). Society for Industrial and Applied Mathematics. **[A rank]** [PDF]

C3 **How Early can we Detect? Detecting Misinformation on Social Media Using User Profiling and Network Characteristics**
Shreya Ghosh and Prasenjit Mitra. ECML PKDD 2023, Page(s): 174–189. Tornio, Italy, 18 - 22 September 2023. **[A rank]** [PDF]

C4 **Tweeted Truth vs Fiction: Dissecting Vaccination Misinformation on Twitter**
Shreya Ghosh and Prasenjit Mitra. ASONAM 2023 (accepted, to appear) **Full paper acceptance rate: 17.2%** [PDF]

C5 **Catching Lies in the Act: A Framework for Misinformation Detection on Social Media**
Shreya Ghosh and Prasenjit Mitra. 34th ACM Conference on Hypertext and Social Media, Page(s): 1–12. Rome, Italy, 04-08 September 2023. **[A rank]** [PDF]

C6 **Activity-Based Mobility Profiling: A Purely Temporal Modeling Approach**
Shreya Ghosh, Soumya K. Ghosh, Rahul Deb Das, and Stephan Winter. 27th *International World Wide Web Conference Companion (WWW), Cognitive Computing Research Track*, pp. 409-416, ACM, Lyon, France, Apr 23-27 2018. [PDF]

C7 **Modeling of Human Movement Behavioural Knowledge from GPS Traces for Categorizing Mobile Users**
Shreya Ghosh, Soumya K. Ghosh. 26th *International World Wide Web Conference Companion (WWW), Cognitive Computing Research Track*, pp. 51-58, ACM, Perth, Australia, Apr 3-7, 2017. [PDF]

Other Publication Outputs (Demo (D*), Poster Paper (P*) and Patent (T*))

T1 **Patent: "A System and Method For Predicting Risk For A Flight Of An Unmanned Aerial Vehicle".** Inventors: Sayan Banerjee, **Shreya Ghosh**, Saptarshi Pal, Sandipan Sen. Patentee: TropoGo Ltd. Application Number: 202141041674. Patent Number: 531567. Date of Grant: 03-04-2024.

D2 **Understanding the Night-Sky? Developing AI-Enabled System for Exploring Night-Light Usage**
Jakob Hederich, *Shreya Ghosh*, Zeyu He and Prasenjit Mitra. The 32nd International Joint Conference on Artificial Intelligence (IJCAI 2023), Macao, SAR, Aug 2023, pp. 7131-7134. (Demo Track) **[A* rank]** [PDF]

D3 **Lumos in the Night Sky: AI-enabled Visual Tool for Exploring Night-Time Light Patterns**
Jakob Hederich, *Shreya Ghosh*, Zeyu He and Prasenjit Mitra. ECML PKDD 2023, Page(s): 340–344. (Demo Track) **[A rank]** [PDF]

P4 **Can You Answer This? Exploring Zero-Shot QA Generalization Capabilities in Large Language Models**
Saptarshi Sengupta, *Shreya Ghosh*, Preslav Nakov and Prasenjit Mitra. Thirty-Seventh AAAI Conference on Artificial Intelligence, 07-14 Feb, 2023. (Poster) **[A* rank]** [PDF]

P5 **MANTRA: Semantic Mobility Knowledge Analytics Framework for Trajectory Annotation**
Shreya Ghosh, and Soumya K. Ghosh. IEEE International Conference on Computer Communications (IEEE INFOCOM), 02-05 May, 2022 (Poster) **[A* rank]** [PDF]

P6 **THUMP: Semantic Analysis on Trajectory Traces to Explore Human Movement Patterns**
Shreya Ghosh, Soumya K. Ghosh. 25th *International World Wide Web Conference (WWW)*, pp. 35-36, ACM, Montreal, Canada, Apr 11-15th, 2016. (Poster) **[A* rank]** [PDF]

Research Projects and Funding

2024-2025   **Geospatial Knowledge Inference Using LLMs for Enhanced Travel Decision-Making** [15 Lakhs INR, Microsoft Academic Partnership Grant (MAPG) 2024]. PI: **Shreya Ghosh**. [LINK]

2024 – 2026   **AI-based framework for Personalized Smart Healthcare using Edge-Cloud Platform** [68 Lakhs INR (Scheme for Promotion of Academic and Research Collaboration (SPARC) Phase III)] PI: **Shreya Ghosh** (Indian PI); Rajkumar Buyya, The University of Melbourne, Australia (Foreign PI)

2023 – 2024   **Unraveling the Impact of Human Activities on Wildlife: An AI-Powered Multimodal Data Analysis** [$50,000 BIG (Big Ideas Grant) Seed Funding 2023]. PI/Co-PI: Prasenjit Mitra, **Shreya Ghosh**, Bing Pan, Peter Newman. **Lead the proposal development and submission.**

2023   **AI-based Wildlife data analytics** [$34,000 Penn State Seed Grant]. PI/ Co-PI: Johnson Kinyua, **Shreya Ghosh**, Prasenjit Mitra, and Titus Adhola. **Lead the proposal development and submission.**

Professional Activities

2024   Publicity Chair, IndoML'24 [LINK]

2023, Oct   **Info-Wild: Knowledge Extraction and Management for Wildlife Conservation. CIKM 2023** (Workshop Co-Chair with Prasenjit Mitra, Bistra Dilkina, Thomas Müller). **Lead the proposal development and website preparation** [Website] [PDF]

2023, Nov   **1st ACM SIGSPATIAL International Workshop on Geocomputational Analysis of Socio-Economic Data (GeoSocial 2023). SigSpatial'2023** (Workshop Co-chair with Soumya K Ghosh, Budhendra Bhaduri, Alexander Zipf) [LINK][PDF]

   1st ACM SIGSPATIAL International Workshop on AI-driven Spatio-temporal Data Analysis for Wildlife Conservation (GeoWildLife 2023). SigSpatial'2023 (Workshop Co-Chair with Prasenjit Mitra, Bistra Dilkina, Thomas Müller). **Lead the proposal development and website preparation** [LINK]

2022, June   **Misinformation and Disinformation in Social Media: Where we are and the Path Ahead** [16th International Conference on Web and Social Media (AAAI ICWSM 2022), 06-June-2022, Atlanta] [LINK] (Tutorial co-organized with Prasenjit Mitra) **Lead the tutorial material preparation and presentation**

2019 – Present   PC Member in CCGRID, ECML PKDD, IEEE Cloud, ACM SigCOMM, MiddleWare, ACM HyperText, ASONAM, AAAI ICWSM. Reviewer in journals: Science, Pervasive and Mobile Computing, IEEE Transactions on Mobile Computing, IEEE Transactions on Network Science and Engineering, etc.

Skills

Coding   Python, R, C, sql, xml/xsl, Html, css, JavaScript, Apache Web Server, LaTeX.

Misc.   Mysql, Postgresql, POSTGIS, Tensorflow, Google Cloud, SUMO, QGIS.

Languages   Strong reading, writing and speaking competencies in English, Bengali and Hindi.

Miscellaneous Experience

Teaching and Advising

2024, Autumn	🔖 *Artificial Intelligence*, *Class of 116 students (Undergraduate, Postgraduate and Research Scholars), IIT Bhubaneswar.* [WebPage]
2024, Spring	🔖 *Design and Analysis of Algorithms* [Theory and Lab component], *Class of 88 undergraduate students, IIT Bhubaneswar.* [WebPage]
2022	🔖 *Data Science Course, Penn State.* Assisted students in formulating problems, understanding data mining and machine learning concepts and completion of data science projects.
2016	🔖 *Programming and Data Structures*, *Class of 120 students, IIT Kharagpur.* <u>Lead TA.</u> Conducting tutorial class (3 hours/ week) and help students to understand the basic concepts and how to solve problems using computer programmes.
2017 – 2019	🔖 *Cloud Computing*, *Class of 90 students.* <u>Lead TA.</u> Served as Lead TA in three semesters, where I was mainly involved in taking tutorial (on MapReduce, public cloud platforms) and demo sessions (1 hour/ week), finalizing the question paper of final exams and evaluating and conducting the quizzes, demo presentations in small group of students.
2018 – 2020	🔖 *Geographical Information System.* <u>Lead TA.</u> Served as Lead TA in three semesters, where my major responsibility was finalizing and formatting the course materials and taking tutorial classes to illustrate spatial database namely Oracle Spatial and Graph, PostGIS, spatial processing tool QGIS.
2018 – 2021	🔖 **Study Webs of Active-Learning for Young Aspiring Minds (SWAYAM), Government of India**: (I) *Cloud Computing* (above 30,000 enrolled candidates). (II) *Google Cloud Computing Foundations.* (III) *Spatial Informatics*
	🔖 **Mentoring (6 UG, 5 PG), IIT Kharagpur**: Successfully mentored final and pre-final year projects on *Internet of Health Things*, *hybrid path planning* and *crowd flow analysis*.
2021 – 2023	🔖 **Mentoring (1 MS, 2 PhD), Penn State**: Assisting students towards their dissertations on *nighttime light data analytics, opinion mining from social media and Question answering system.*
2024 – Present	🔖 **Mentoring (1 MS, 1 PhD, 2 PostGraduate and 5 B.Tech), IIT Bhubaneswar**: Assisting students towards their dissertations on *misinformation detection, multi-modal LLMs and Geospatial modelling.*

Awards and Achievements

2023	🔖 **Nominated for Ted Nelson (newcomer) Award**, ACM HyperText (Paper: Catching Lies in the Act)
2018 – 2023	🔖 **Travel Grant**, ACM Hypertext'23, ECML PKDD D&I'23, Microsoft Research Travel (for WWW'17), ICPR/IAPR Travel'18, International Travel Scheme Award, SERB, DST'18 and IEEE Student Travel'18
2017 – 2020	🔖 **TCS PhD Research** Scholarship
2016	🔖 **Award in IBM Day Demo competition.** Title: *Mobility Summary and User Categorization based on Semantic Analysis of Human Movement Patterns*
2015	🔖 **2nd rank in Cognizant CIO's Challenge for Students**, Selected in IT foundation of Cognizant Certified Program. Developed an web-application titled *SQL-VAL: Validate your SQL queries without executing!* to upload and validate SQL query syntax without execution.

References

Dr. Prasenjit Mitra. Professor, Penn State, USA Email: pmitra@psu.edu. [**Postdoc advisor**]
Dr. Soumya K. Ghosh. Professor, IIT Kharagpur, India Email: skg@cse.iitkgp.ac.in. [**PhD advisor**]
Dr. Rajkumar Buyya. Redmond Barry Distinguished Professor, The University of Melbourne, Australia. Email: rbuyya@unimelb.edu.au [**Research collaborator**]
Dr. Preslav Nakov. Department Chair of Natural Language Processing, and Professor of Natural Language Processing, Mohamed bin Zayed University of Artificial Intelligence (MBZUAI). Email: Preslav.Nakov@mbzuai.ac.ae [**Research collaborator**]