

Adway Mitra

CONTACT INFORMATION

Centre of Excellence in Artificial Intelligence
Indian Institute of Technology
Kharagpur

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RESEARCH INTERESTS

- **Machine Learning** - Modeling complex Spatio-Temporal Processes, Bayesian Modeling, Agent-based Modeling
- **Climate Sciences** - Climate Modeling and Simulation, Causality Analysis

Positions held

1. Assistant Professor, Centre for Artificial Intelligence, Indian Institute of Technology Kharagpur
 - Duration: July 2019 - present
2. Assistant Professor, School of Electrical Sciences, Indian Institute of Technology Bhubaneswar
 - Duration: March 2018 - June 2019

Post-Doctoral Research Experience

- Airbus Prize Post Doctoral Fellow, International Center for Theoretical Sciences, Bangalore *June, 2016- February, 2018*
- Research Topic: Data-driven modeling of Indian Monsoon
- Faculty Advisor: Dr. Amit Apte
- Faculty Collaborators: Dr. Rama Govindarajan, Dr. Vishal Vasan, Dr. Sreekar Vadlamani

Other Research Experience

- Research Associate, Divecha Center for Climate Change, Indian Institute of Science, Bangalore *Oct 2015 -June, 2016*
- Summer Internship in Yahoo! Labs - Bangalore, India *May -July, 2011* (under Dhruv Mahajan and Rajeev Rastogi)
- Summer Internship in IBM India Research Lab - Bangalore, India *August-October, 2012* (under Srujana Merugu)

EDUCATION

- **Doctor of Philosophy in Computer Science**
Indian Institute of Science, Bangalore *Aug 2010 - Aug 2015*
CGPA - 7.0/8.0
Doctoral Thesis: Bayesian Nonparametric Modeling of Temporal Coherence for Entity-driven Video Analytics
Doctoral Advisor: Prof. Chiranjib Bhattacharyya
- **Master of Engineering in Computer Science & Engineering (First Class with Distinction)**
Indian Institute of Science, Bangalore *Aug 2008 - Jul 2010*
CGPA - 6.8/8.0 (Course), 8.0/8.0 (Project), 7.3/8.0 (combined)
M.E. Thesis: Efficient Covariance-based Algorithms for Appearance Modeling

in Computer Vision
M.E. Thesis Advisor: Prof. Chiranjib Bhattacharyya

- **Bachelor of Engineering in Computer Science (First Class Honours, Department Rank 3)**
Jadavpur University, Kolkata *Jul 2004 - Jun 2008*
CGPA - 9.0/10.0 (84.04%)

Research Guidance

- Doctoral: 2 ongoing in IIT Kharagpur
- Masters': 1 completed in IIT Bhubaneswar
- Undergraduate: 4 completed in IIT Bhubaneswar, 12 ongoing in IIT Kharagpur
- Internship: 1 completed in ICTS-TIFR, 6 ongoing in IIT Kharagpur

TEACHING EXPERIENCE

- As main instructor
 1. Machine Learning for Earth System Sciences in IITKGP Jan-May, 2020
 2. Machine Learning: Foundations and Applications course in IITKGP July-Nov., 2019
 3. Natural Language Processing course in IITBBS Jan-April.,2019
 4. Machine Learning and Data Analytics course in IITBBS Jan-April.,2019
 5. Machine Learning and Data Analytics course in IITBBS July-Nov.,2018
 6. Discrete Structures course in IITBBS July-Nov.,2018
 7. Programming and Data Structures Lab in IITBBS July-Nov.,2018, Jan-April.,2019
- As co-instructor
 1. Design and Analysis of Algorithms course in IITBBS March-April,2018
 2. Natural Language Processing course in IITBBS March-April,2018
 3. Design and Analysis of Algorithms Lab in IITBBS March-April,2018
- As Teaching Assistant
 1. Machine Learning course in IISc *Jan -April, 2016*
 2. Linear Algebra course in IISc *Aug-Dec, 2014*
 3. Machine Learning course in IISc *Jan -April, 2013*
 4. Linear Algebra course in IISc *Aug-Dec, 2012*
 5. Machine Learning course in IISc *Jan -April, 2012*

PUBLICATIONS

- **Journals**
 1. Arjun Sharma, Adway Mitra, Vishal Vasan, Rama Govindarajan. **Evolution of spatial patterns of rainfall and convective clouds during Indian Monsoon.** *International Journal of Climatology, 2020*
 2. Madhumita Chakraborty, Soumyajit Sarkar, Abhijit Mukherjee, Mohammad Shamsudduha, Kazi Matin Ahmed, Animesh Bhattacharya, Adway Mitra. **Modeling regional-scale groundwater arsenic hazard in the trans-boundary Ganges River Delta, India and Bangladesh: infusing physically-based model with supervised machine learning.** *Science of the Total Environment, 2020*

3. Adway Mitra, Ashwin Seshadri. **Detection of Spatio-temporally Coherent Rainfall Anomalies using Markov Random Fields**, *Computers and Geosciences (CAGEO)*, Vol. 22, Jan 2019
 4. Adway Mitra, Amit Apte, Rama Govindarajan, Vishal Vasam, and Sreekar Vadlamani, **Spatio-temporal Patterns of Indian Monsoon Rainfall**; *Dynamics and Statistics of the Climate System: An Interdisciplinary Journal*, 2018.
 5. Adway Mitra, Amit Apte, Rama Govindarajan, Vishal Vasam, and Sreekar Vadlamani, **A Discrete View of the Indian Monsoon to Identify Spatial Patterns of Rainfall**, *Dynamics and Statistics of the Climate System: An Interdisciplinary Journal*, 2018.
 6. Adway Mitra, Soma Biswas, Chiranjib Bhattacharyya. **Temporally Coherent Chinese Restaurant Process for Discovery of Persons and Corresponding Tracklets from User-generated Videos**. *IEEE Transactions on Pattern Analysis and Machine Intelligence (PAMI)*, Vol. 39(3), 2017
- **Refereed Conferences**
 1. Adway Mitra, **Identifying Coherent Anomalies in Multi-Scale Spatio-Temporal Data using Markov Random Fields**, *IEEE Big Data, Boston, USA, 2017*.
 2. Adway Mitra, **Bayesian approach to Spatio-temporally Consistent Simulation of Daily Monsoon Rainfall over India**, *ACM SIGSPATIAL Conference, Los Angeles, USA, 2017*.
 3. Adway Mitra, Chiranjib Bhattacharyya and Soma Biswas. **EntScene: Nonparametric Bayesian Temporal Segmentation of Videos aimed at Entity-driven Scene Detection** *International Joint Conference on Artificial Intelligence (IJCAI), Buenos Aires, Argentina, 2015*
 4. Adway Mitra, Soma Biswas and Chiranjib Bhattacharyya. **Temporally Coherent CRP: A Bayesian Non-Parametric Approach for Clustering Tracklets with applications to Person Discovery in Videos**. *SIAM Conference on Data Mining (SDM), Vancouver, Canada, 2015*
 5. Adway Mitra and Srujana Merugu. **Reconciliation of Categorical Opinions from Multiple Sources**. *ACM Conference on Information and Knowledge Management (CIKM), San Francisco, USA, 2013*
 6. Adway Mitra, Ranganath B.N. and Indrajit Bhattacharyya. **A Layered Dirichlet Process for Hierarchical Segmentation of Sequential Grouped Data**. *European Conference on Machine Learning (ECML-PKDD), Prague, 2013*
 7. Dhruv Mahajan, Rajeev Rastogi, Charu Tiwari and Adway Mitra. **LogUCB: An Explore-Exploit Algorithm for Comments Recommendation**. *ACM Conference on Information and Knowledge Management (CIKM), Hawaii, 2012*
 8. Anoop K.R., Adway Mitra, Ujwal Bonde, Chiranjib Bhattacharyya and K.R.Ramakrishnan. **Covariance Profiles: A Signature Representation For Object Sets**. *International Conference on Pattern Recognition (ICPR), Japan, 2012*
 9. Adway Mitra, Anoop K.R., Ujwal Bonde, Chiranjib Bhattacharyya and K.R.Ramakrishnan. **Eigen-profiles of Spatio-Temporal Fragments for Adaptive Region-based Tracking**. *International Conference on Acoustics, Speech and Signal Processing (ICASSP), Kyoto, Japan, 2012*

10. Adway Mitra, Arpan Roy, Arijit Khan, Debasis Saha. **An Informed Lane-Based Target Search Strategy for Random-Walking Mobile Sensors.** (*International Conference on Sensing Technology, 2008, Tainan, Taiwan*)
11. Arpan Roy, Haimasree Bhattacharya, Adway Mitra, Shibasis Biswas, Pradip K. Das. **A Distributed Approach to GIS systems and Location-based Service for Internet-enabled Handheld Mobile Devices.** (*IET International Conference on Wireless Mobile and Multimedia Networks, 2008, Mumbai*)
12. Arpan Roy, Adway Mitra, Arijit Khan and Debasis Saha. **LSDC: A Lossless Approach to Lifetime Maximization in Wireless Sensor Networks.** (*IEEE Sensor Application Symposium, 2008, Atlanta, USA*)
13. Adway Mitra, Arpan Roy, Arijit Khan, Debasis Saha. **EMOBSPIN: An Energy-aware Negotiation-based Information Dispersal Protocol for Mobile Sensor Networks.** (*International Symposium on Wireless Personal Multimedia Communications, 2007, Jaipur, India*)

- **Refereed Workshops**

1. Alok Kumar Samantaray, Adway Mitra, Meenu Ramadas. **A probabilistic graphical model approach to identify spatial changes in monthly precipitation under climate change.** *AI for Earth Science Workshop (co-hosted with International Conference on Learning Representation), 2020*
2. Imme Ebert-Uphoff, Whitney Huang, Adway Mitra, Dan Cooley, Singdhansu Chatterjee, Chen Chen and Zhonglei Wang. **Studying Extremal Dependence in Climate Using Complex Networks,** *Climate Informatics Workshop, National Center for Atmospheric Research (NCAR), Boulder, USA, 2018*
3. Adway Mitra (2017). **Spatio-temporally consistent simulation of daily rainfall over India,** *Climate Informatics Workshop, National Center for Atmospheric Research (NCAR), Boulder, USA, 2017*
4. Adway Mitra, Amit Apte, Rama Govindarajan, Vishal Vasani, Sreekar Vadlamani. **Tracking the propagation of planetary scale cloud zones over Indian Ocean and South Asia with Markov Random Fields,** *Climate Informatics Workshop, National Center for Atmospheric Research (NCAR), Boulder, USA, 2017*
5. Adway Mitra, Amit Apte, Rama Govindarajan, Vishal Vasani, Sreekar Vadlamani. **Finding Active and Break spells of Indian Monsoon by Markov Random Fields,** *Climate Informatics Workshop, National Center for Atmospheric Research (NCAR), Boulder, USA, 2017*
6. Adway Mitra, Ashwin Seshadri. **Predictability of attributes of annual and monthly rainfall over India,** *Climate Informatics Workshop, National Center for Atmospheric Research (NCAR), Boulder, USA, 2017*
7. Adway Mitra. **Coherent Spatial Clusters for Indian Rainfall Anomalies across Time Scales** *SIAM Conference on Data Mining (SDM) - Workshop on Mining Big Data for Climate and Environment, Houston, USA, 2017*
8. Adway Mitra. **Spatio-Temporal Generative Models for Rainfall over India** *Climate Informatics Workshop, NCAR, Boulder, USA, 2016*

INVITED TALKS

- Identifying spatial and temporal patterns of climatic variables using Markov Random Field - at International Indian Statistical Association Conference, IIT Bombay (Dec 2019)
- Bayesian Learning - at STC on Machine Learning and Data Analytics, Jadavpur University, Kolkata, (March 2019)
- Person Discovery in Movie Videos - at STC on Machine Learning in Image and VideoAnalytics at IIT(BHU), Varanasi, India (December 2018)
- EntScene: Nonparametric Bayesian Temporal Segmentation of Videos aimed at Entity-driven Scene Detection - at CODS-IKDD conference, Pune, India (March 2016)
- Bayesian Nonparametric Modeling of Temporal Coherence for Entity-driven Video Analytics - at Amazon, India (Feb 2016)
- Bayesian Nonparametric Modeling of Temporal Coherence for Entity-driven Video Analytics - at Xerox Research Center India (Feb 2016)

PROFESSIONAL SERVICE

- Served as Program Committee Member for 3rd Young Researchers' Symposium, held alongside CODS-COMAD 2019, Hyderabad
- Served as reviewer for Climate Informatics workshop, 2019
- Served as Program Committee Member for 2nd Young Researchers' Symposium, held alongside CODS-COMAD 2019, Kolkata
- Served as reviewer for Environmetrics journal, 2018
- Served as the Professor-in-Charge of Web Services, IIT Bhubaneswar, April 2018- June 2019

HONORS AND AWARDS

- Selected as a fellow of **Japan-India Transformative Technology Network**, 2020
- Recipient of **Airbus Postdoctoral Fellowship** for the period 2017-19
- **Runners-up in International World Wide Web (WWW) 2011 Novel Web Software Contest** for the software "Web-based Image Recognizer" (joint work with Himabindu Lakkrajju)
- **All India Rank 58** (99.67%ile) in Graduate Aptitude Test in Engineering (GATE), 2008, entrance exam of the IISc & IITs, in Computer Science & Engineering, out of 18,224 candidates
- **Department Rank 3**, Bachelor of Engineering, Computer Science (out of 60 students)
- **State Rank 5** in West Bengal Joint Entrance Examination, 2004 for Engineering Entrance (out of over 50000 candidates)
- Jagadis Bose National Science Talent Search (JBNSTS) Senior Scholarship, 2004-08
- **State Rank 20** in Regional Mathematical Olympiad (for West Bengal), 2002

COMPUTER SKILLS

- Languages: Java,C,C++,Python
- Software: Matlab, LATEX
- Platforms: Linux, Microsoft Windows XP, 7, 10