Debanjan Sadhukhan

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debanjan-sadhukhan

Experience

Senior Research Scientist *Bangalore, India*
Games24x7 *May 2024 - Present*

- Led a team to convert business problems into research challenges and aligned stakeholders on their complexity and strategic impact
- Developed an interpretable deep reinforcement learning-based user-ranking method to help designing new campaigns

Research Scientist *Bangalore, India*
Games24x7 *Jan 2022 - April 2024*

- Devised a novel causal-discovery technique in volatile user gameplay-behavior to discover causal-relationship and generate personalized treatments
- Developed a deep reinforcement learning based recommendation to optimize gameplay intensity tailored to user personas (resulted in 3% improvement in engagement)

Data Science Consultant *Bangalore, India*
ZS *Dec 2020 - March 2021*

- Leverages conventional (such as XG-Boost with SHAP and LIME, Bayesian, and LSTM) and state-of-the-art (TabNet by Google) techniques for better industry-analytic forecasting

Post-doc Research Fellow *Grand Forks, USA*
University of North Dakota *Jan 2019 - Aug 2020*

- Applied computer-vision based techniques such as Mask R-CNN, Fast R-CNN, and Faster R-CNN to thermal images to quantify standard heat transfer coefficient (U-value in BTU/hr/Sq.ft./F)
- Optimized cost, HVAC control system using mixed-integer linear programming for smart building management applications

Engineer *Bangalore, India*
Boeing Research & Technology *Oct 2017 - Dec 2018*

- Leveraged ML-based predictive collaborative stream filtering techniques for edge computing to promote bandwidth management and better aircraft state diagnostic system.
- Involved into design and implementation of optimization techniques for Boeing Smart Factory (an application to IoT)

Project Associate *IISc, Bangalore, India* *Jan 2017 - Aug 2017*

- Leveraged stochastic optimization based techniques for energy harvested IoT network.

Education

Doctor of Philosophy (PhD) *Sept 2010 – Sept 2017*
Indian Institute of Technology Guwahati

- **Department:** Computer Science & Engineering
- **Supervisor:** Prof. S. V. Rao
- **Thesis title:** Stochastic Approach to Quality of Service in Data Gathering for Wireless Sensor Networks *(An application of stochastic optimization and IoT)*
- **CGPA:** 8.34/10 (during coursework)

Bachelor of Technology (BTech) *Jul 2005 – Jul 2009*
West Bengal University of Technology

- **Department:** Informational Technology

- **CGPA:** 8.45/10

Selected Publications

Conferences

- **D. Sadhukhan** et al., EFfECT-RL: Enabling Framework for Establishing Causality and Triggering engagement through RL. In Proceedings of the 33rd ACM International Conference on Information and Knowledge Management (CIKM), Boise, USA, 2024 (pp. 4836-4843) (Link).
- S. Anand et al., Generalized Experiment Conclusion Framework for Extremely Volatile Data, Proceedings of the 12th ACM IKDD CODS and 30th COMAD, Jodhpur, India, 2024.
- **D. Sadhukhan** et al., t-RELOAD: A REinforcement Learning-based Recommendation for Outcome-driven Application. In Proceedings of the Third International Conference on AI-ML Systems (pp. 1-7), Bangalore, India, 2023. (Link).
- Y. Arjoune et al, Thermal Imagery Based Instance Segmentation for Energy Audit Applications in Buildings, IEEE International Conference on Big Data, Los Angeles, USA, 2019 (Link).
- K. Koiner et al., Heat Loss Estimation using UAS Thermal Imagery, *IEEE EIT, South Dakota, USA, 2019* (Link).
- M. Poznaik et al., RF Exploitation and Detection Techniques using Software Defined Radio: A Survey, *IEEE EIT, South Dakota, USA, 2019* (Link).
- **D. Sadhukhan** et al., Critical Sensor Density for Event-driven Data-gathering in Delay and Lifetime Constrained WSN, *International Conference on WWIC, Thessaloniki, Greece, 2016* (Link).

Journals

- Y. Arjoune et al., An Instance Segmentation and Clustering Model for Energy Audit Assessments in Built Environments: A Multi-stage Approach, MDPI Sensors, 2021, (Link).
- **D. Sadhukhan** et al., Estimating Surface Temperature from Thermal Imagery of Buildings for AccurateThermal Transmittance (U-value): A Machine Learning Perspective, Journal of Building Engineering, Elsevier, 2020 (Link).
- **D. Sadhukhan** et al., Energy Efficient Multi-Beacon Guard Method for Periodic Data Gathering in Time Synchronized WSN, Wireless Networks, DOI: 10.1007/s11276-020-02400-5, Springer, 2020. (Link).
- **D. Sadhukhan** et al., Minimizing Critical Event Delay and Maximizing Lifetime in a Dynamic Hybrid Datagathering, Wireless Personal Communications, DOI: 10.1007/s11277-020-07999-4, Springer, 2021. (Link).
- **D. Sadhukhan** et al., Minimum cost event driven WSN with spatial differentiated QoS requirements, Wireless Networks, Springer: 1-17, 2018 (Link).
- **D. Sadhukhan** et al., Effect of Clock-skew in Event-Driven, Delay Constrained Heterogeneous WSN with Anycast, Wireless Personal Communications, Springer, 97(4): 4967-4980, 2017 (Link).

Posters

- Heat Loss Estimation using UAS Thermal Imagery", *AUVSI XPonential 2019, Chicago, USA, 2019.*
- Edge Detection and Dominant Color Masking of Thermal Imagery Data Sets, *Graduate Research Achievement Day, University of North Dakota, ND, USA, 2019.*
- Thermal Imagery Based Instance Segmentation for Energy Audit Applications in Buildings, IEEE Big Data, Los Angeles, USA, 2019.

Proposals

- Assisted in writing for the University of North Dakota, Research and Economic Development in Post-doctoral seed funding program for "Artificial Intelligence (AI) Models for Physical Property Extraction in Highly Variable Mixed Stream Post-Consumer Polymers" in 2020.
- Assisted in writing a National Science Foundation (NSF) Proposal (Division of Computer and Network Systems) for "Multi-agent System based Hierarchical Architecture for Connected Systems" in NSF-CPS, 2019.
- Assisted in writing in the Intelligent Pipeline Integrity Program (iPIPE) consortium for "An Artificial Intelligence (AI) based Oil Spill Response using BVLOS Infrared and Optical Gas Imaging" in 2019.

- Assisted in writing in the Google AI Proposal for "Evaluation of End-to-End Training for an Optimal Machine Learning Workflow Model: Thermal Infrastructure Data Set (Use case)" in 2019.

Achievements

- Granted Travel Grant to present accepted paper in WWIC, 2016.
- Qualified GATE with Score 511 (97 percentile), 2010.
- Granted MHRD Research Fellowship, 2010.

Position of Responsibility

- Reviewer for ACM CODS-COMAD, ACM AI-ML Systems, IEEE Systems, IEEE Sensors, Springer Wireless Network, Springer Electrical Engineering Journals.
- Member of the PhD Council of the SAB, IIT Guwahati, from 2014 to 2015.
- Volunteer for the Research Conclave, IIT Guwahati, in March 2015.

References

Prof. P. Ranganathan *Associate Professor, School of Electrical Engineering and Computer Science, University of North Dakota, USA Email: prakash.ranganathan@und.edu* Webpage

Prof. S. V. Rao *Professor, Department of Computer Science & Engineering, Indian Institute of Technology Guwahati, India Email: svrao@iitg.ac.in* Webpage

Dr. R. Datta *Computer Research Scientist, School of Computing Faculty, University of South Alabama, USA Email: rituparndatta@gmail.com* Webpage