

Bishwamittra Ghosh

Research Interests

Formal methods in trustworthy machine learning; Foundational understanding of large language models; Fairness and explainability of machine learning.

Employment

Since 02.24 **Postdoctoral Researcher**, *Max Planck Institute for Software Systems*, Germany.
Advisor: Dr. Krishna P. Gummadi

Education

- 01.18 – 09.23 **PhD in Computer Science**, *National University of Singapore (NUS)*, Singapore.
Advisor: Dr. Kuldeep S. Meel
Thesis: Interpretability and Fairness in Machine Learning: A Formal Methods Approach
- 02.13 – 09.17 **BSc in Computer Science and Engineering**, *Bangladesh University of Engineering and Technology (BUET)*, Bangladesh, CGPA: 3.83 out of 4 (with Honours).
Advisor: Dr. Mohammed Eunus Ali
Thesis: The Flexible Socio Spatial Group Queries

Publications (sorted by year)

Conference Papers

- ICLR-25 Logical Consistency of Large Language Models in Fact-checking
[Bishwamittra Ghosh](#), Sarah Hasan, Naheed Anjum Arafat, Arijit Khan
- AAAI-25 Active Fourier Auditor for Estimating Distributional Properties of ML Models
Ayoub Ajarra, [Bishwamittra Ghosh](#), Debabrota Basu
- WSDM-25 Towards Reliable Latent Knowledge Estimation in LLMs: Zero-Prompt Many-Shot Based Factual Knowledge Extraction
Qinyuan Wu, Mohammad Aflah Khan, Soumi Das, Vedant Nanda, [Bishwamittra Ghosh](#), Camila Kolling, Till Speicher, Laurent Bindschaedler, Krishna P. Gummadi, Evimaria Terzi
- CAI-24 Split Learning of Multi-Modal Medical Image Classification
[Bishwamittra Ghosh](#), Yuan Wang, Huazhu Fu, Wei Qingsong, Yong Liu, Rick Goh
- FACCT-23 “How Biased are Your Features?”: Computing Fairness Influence Functions with Global Sensitivity Analysis
[Bishwamittra Ghosh](#), Debabrota Basu, Kuldeep S. Meel
- VLDB-23 Neighborhood-based Hypergraph Core Decomposition
Naheed Anjum Arafat, Arijit Khan, Arpit Kumar Rai, [Bishwamittra Ghosh](#)
- AAAI-22 Algorithmic Fairness Verification with Graphical Models
[Bishwamittra Ghosh](#), Debabrota Basu, Kuldeep S. Meel
- AAAI-21 Justicia: A Stochastic SAT Approach to Formally Verify Fairness
[Bishwamittra Ghosh](#), Debabrota Basu, Kuldeep S. Meel
- AAAI-20 A MaxSAT-based Framework for Group Testing
Lorenzo Ciampiconi, [Bishwamittra Ghosh](#), Jonathan Scarlett, Kuldeep S. Meel

- ECAI-20 Classification Rules in Relaxed Logical Form
Bishwamittra Ghosh, Dmitry Malioutov, Kuldeep S. Meel
- AIES-19 IMLI: An Incremental Framework for MaxSAT-Based Learning of Interpretable Classification Rules
Bishwamittra Ghosh, Kuldeep S. Meel
- VLDB-18 The Flexible Socio Spatial Group Queries
Bishwamittra Ghosh, Mohammed Eunus Ali, Farhana M. Choudhury, Sajid Hasan Apon, Timos Sellis, Jianxin Li

Journal Papers

- JAIR-22 Efficient Learning of Interpretable Classification Rules
Bishwamittra Ghosh, Dmitry Malioutov, Kuldeep S. Meel
- TSAS-21 Social-Spatial Group Queries with Keywords
 Sajid Hasan Apon, Mohammed Eunus Ali, Bishwamittra Ghosh, Timos Sellis

Professional Experiences

Tutorials

- IJCAI-23 Auditing Bias of Machine Learning Algorithms: Tools and Overview

Talks

- Academia Microsoft Research (24), University of Michigan, Dearborn (23), MPI-SWS (22), INRIA (22)
 Conferences FAccT (23), AAI (22, 21, 20), ECAI (20), CP (19), VLDB (19), IJCAI (19), AIES (19)

Program Committee

AAAI (25)

Academic Reviewer

NeurIPS, ICML, AAI, TNNLS, TMI, AIES, CAV, TKDE

Research Visit

- 03.23 – 05.23 Max Planck Institute For Software Systems, Saarbrücken, Germany
 11.21 – 02.22 INRIA, Lille-Nord, France
 06.21 – 08.21 Goldman Sachs, Singapore
 03.20 – 06.20 Max Planck Institute For Software Systems, Kaiserslautern, Germany

Graduate Assistant (NUS)

- 2018 – 2021 CS2030 Programming Methodology II
 2020 CS3243: Introduction to Artificial Intelligence

Past Employment

- 06.23 – 02.24 **Scientist**, *Institute of High Performance Computing (IHPC)*, A*STAR, Singapore.
 10.17 – 01.18 **Lecturer**, *Department of CSE, United International University (UIU)*, Bangladesh.

Awards

- 2021 Moblilex Scholarship, Université de Lille, France
 2018 – 2023 NUS Research Scholarship, Singapore
 2013 – 2017 University Deans List, BUET, Bangladesh
 2011, 2012 National Math Olympiad winner, Bangladesh
 2012 National Chemistry Olympiad winner, Bangladesh

References

- **Kuldeep S. Meel**
Associate Professor
Department of Computer Science
University of Toronto, Canada
Email: meel+recos@comp.nus.edu
- **Krishna P. Gummadi**
Faculty (Scientific Director)
Head, Networked Systems Research Group
MPI-SWS, Germany
Email: gummadi@mpi-sws.org
- **Arijit Khan**
Associate Professor
Department of Computer Science
Aalborg University, Denmark
Email: arijitk@cs.aau.dk
- **Debabrota Basu**
Faculty (equivalent of Assoc. Prof.)
Scool Team
Inria at Université de Lille and CNRS, France
Email: debabrota.basu@inria.fr