

# 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

- 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

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## 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.

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## 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  
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- **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  
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