Bishwamittra Ghosh

Postdoctoral Researcher
MPI-SWS, Germany
✉ *bghosh@mpi-sws.org*
⌂ *bishwamittra.github.io*
scholar, dblp

Research Interests

My research applies formal methods to machine learning, with a focus on advancing the foundational understanding of large language models and improving the trustworthiness of machine learning systems through enhanced fairness and interpretability.

Appointment

Since 04.24 **Postdoctoral Researcher**, *Max Planck Institute for Software Systems*, Germany.
Advisor: Dr. Krishna P. Gummadi

06.23 – 03.24 **Scientist**, *Institute of High Performance Computing (IHPC), A*STAR*, Singapore.

01.18 – 06.23 **Graduate Research Assistant**, *National University of Singapore (NUS)*, Singapore.

10.17 – 01.18 **Lecturer**, *Department of CSE, United International University (UIU)*, Bangladesh.

Education

01.18 – 09.23 **PhD in Computer Science**, *National University of Singapore (NUS)*, Singapore.
Thesis: Interpretability and Fairness in Machine Learning: A Formal Methods Approach
Advisor: Dr. Kuldeep S. Meel

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).
Thesis: The Flexible Socio Spatial Group Queries
Advisor: Dr. Mohammed Eunus Ali

Publications (reverse chronological order)

Conference Papers

ICLR-25 Logical Consistency of Large Language Models in Fact-checking
<u>Bishwamittra Ghosh</u>, Sarah Hasan, Naheed Anjum Arafat, Arijit Khan

AAAI-25 Active Fourier Auditor for Estimating Distributional Properties of ML Models
Ayoub Ajarra, <u>Bishwamittra Ghosh</u>, 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, <u>Bishwamittra Ghosh</u>, Camila Kolling, Till Speicher, Laurent Bindschaedler, Krishna P. Gummadi, Evimaria Terzi

ECAI-25 History-Aware and Dynamic Client Contribution in Federated Learning
<u>Bishwamittra Ghosh</u>, Debabrota Basu, Huazhu Fu, Yuan Wang, Renuga Kanagavelu, Jin Peng Jiang, Yong Liu, Rick Siow Mong Goh, Qingsong Wei

CAI-24 Split Learning of Multi-Modal Medical Image Classification
<u>Bishwamittra Ghosh</u>, 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
<u>Bishwamittra Ghosh</u>, Debabrota Basu, Kuldeep S. Meel

VLDB-23 Neighborhood-based Hypergraph Core Decomposition
Naheed Anjum Arafat, Arijit Khan, Arpit Kumar Rai, <u>Bishwamittra Ghosh</u>

AAAI-22 Algorithmic Fairness Verification with Graphical Models
<u>Bishwamittra Ghosh</u>, Debabrota Basu, Kuldeep S. Meel

AAAI-21 Justicia: A Stochastic SAT Approach to Formally Verify Fairness
<u>Bishwamittra Ghosh</u>, Debabrota Basu, Kuldeep S. Meel

AAAI-20 A MaxSAT-based Framework for Group Testing
Lorenzo Ciampiconi, <u>Bishwamittra Ghosh</u>, 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

Invited Talks	Trustworthy Machine Learning: A Formal Methods Approach ○ Microsoft Research (24), University of Michigan, Dearborn (23), MPI-SWS, Germany (22), INRIA, France (22), IHPC, Singapore (22)
Conference Talks	ICLR (25), FAccT (23), AAAI (22, 21, 20), ECAI (20), CP (19), VLDB (19), IJCAI (19), AIES (19)

Program Committee

AAAI (25)

Reviewer

NeurIPS, ICML, AAAI, TMLR, KDD, JAIR, AIES, CAV, TNNLS, TMI, 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, Bangalore, India
03.20 – 06.20	Max Planck Institute For Software Systems, Kaiserslautern, Germany

Teaching Service

06.18 – 06.21	CS2030: Programming Methodology II, *NUS*
06.20 – 12.20	CS3243: Introduction to Artificial Intelligence, *NUS*
Fall'17	Numerical Methods, *UIU*
Fall'17	Data Communication, *UIU*

Awards and Honors

2025, 2026	Invited for Dagstuhl Seminar, Schloss Dagstuhl - Leibniz Center for Informatics, Germany
2025	KDD 2025 Outstanding reviewer (top 10% of reviewers)
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

- **Krishna P. Gummadi**
  Scientific Director
  MPI-SWS, Germany
  Email: gummadi@mpi-sws.org

- **Kuldeep S. Meel**
  Associate Professor
  School of Computer Science
  Georgia Institute of Technology, USA
  Email: send.Meel.50BA24C00F@interfoliodossier.com

- **Debabrota Basu**
  Faculty (equivalent of Associate Professor)
  Scool Team
  INRIA at Université de Lille and CNRS, France
  Email: send.Basu.97FB75E1B5@interfoliodossier.com

- **Arijit Khan**
  Associate Professor
  Department of Computer Science
  Aalborg University, Denmark
  Email: send.Khan.A8C7FAA819@interfoliodossier.com