

Mononito Goswami

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[LinkedIn](#) | [ResearchGate](#) | [Google Scholar](#) | [Website](#)

TECHNICAL EXPERTISE

Foundation Models

- *Core capabilities:* Structured Data ([MOMENT](#), [IngesTables](#)), Multimodality ([JoLT](#)), Long-context ([Infini-Channel Mixer](#)),
- *Emergent capabilities:* Reasoning ([TimeSeriesExam](#), [P1](#)), Agents
- *Pragmatic Advancements:* Interpretability & Steerability ([P1](#)), Efficiency

Machine Learning in the Real World

- *Considerations:* Distributed data ([WSHFL](#), [PICSIR](#)), Label Noise ([AQuA](#)), Model Selection ([TSADMS](#)), Unlabeled Data ([Programmatic Weak Supervision](#))
- *Applications:* Healthcare ([ECG](#), [SPO₂](#) & [Pleth](#), [EEG](#), [Clinical Notes](#), [Survival Analysis](#)), Education ([Peer Learning](#), [Problem Solving](#), [Intelligent Tutoring Systems](#))

EDUCATION

Doctor of Philosophy in Robotics 2020 - 2025 (expected)
[Carnegie Mellon University](#), Pittsburgh PA, USA

- Doctoral Dissertation: Towards Pragmatic Time Series Intelligence
- Advisor: [Prof. Artur Dubrawski](#)

Bachelor of Technology in Computer Engineering 2016 - 2020
[Delhi Technological University](#), New Delhi, India

- Thesis: Towards Social & Engaging Peer Learning [[Paper 1](#), [Paper 2](#)]

FELLOWSHIPS

[Centre for Machine Learning and Health \(CMLH\)](#) 2021 2021 - 2022

PROFESSIONAL EXPERIENCE

Student Researcher May 2023 - Present
Google Research, New York, USA

- Machine Learning research on building, pre-training and evaluating **foundation models for tabular data**, along with [Scott Yak](#), [Joe Toth](#), [Yihe Dong](#), [Sercan Arik](#).

Applied Scientist Intern May - August 2023
Amazon Web Services AI Labs, Seattle, USA

- Ideated and built one of the first **time series foundation models**, along with [Bariş Kurt](#), [Andrey Kan](#), [Gauthier Guinet](#), [Jingchao Ni](#), [Jonas Kübler](#) and [Laurent Callot](#).

Applied Scientist Intern May - August 2022
Amazon Web Services AI Labs, Seattle, USA

- Developed one of the first algorithms for unsupervised model selection of time series anomaly detection models, in collaboration with [Andrey Kan](#), [Lenon Minorics](#) and [Laurent Callot](#) [[Paper](#)].

Robotics Institute Summer Scholar June 2019 - August 2020
Auton Lab, Carnegie Mellon University, Pittsburgh, USA

- Machine Learning research on detecting cognitive disequilibrium and flow in children solving math problems, advised by [Prof. Lujie \(Karen\) Chen](#) and [Prof. Artur Dubrawski](#) [[Paper](#), [Student abstract](#)].

Robotics Institute Summer Scholar June 2018 - September 2020
RoboTutor Project, Carnegie Mellon University, Pittsburgh, USA

- Developed Statistical Probe of Tutoring (SPOT), a tool for iterative data-driven improvement of [RoboTutor](#), an Intelligent Tutoring System (ITS), advised by [Prof. Jack Mostow](#) [[Paper](#), [Student abstract](#)].

Equity Research Intern December 2017
Phillip Capital, Mumbai, India

- Conducted research on emerging technologies such as Blockchain and edge computing and their potential impact on the FinTech sector.

Intern June - July 2017
Goods & Services Tax Network (GSTN), New Delhi, India

- Collaborated with consultants from PwC, Infosys, and State Tax departments to design an Analytics and Risk Management framework. Co-created a user-friendly tool to streamline tax submissions for the nationwide GST rollout in India.

Undergraduate Researcher 2017 - 2020
Delhi Technological University, New Delhi, India

- Analyzing dyadic interactions between young children to identify non-verbal cues that aid effective story-telling, advised by [Prof. Rajni Jindal](#) [[Paper 1](#), [Paper 2](#)].
- Developed a Multi-task Learning approach for Open Domain Suggestion Mining and a novel language model-based text over-sampling method, advised by [Ms. Minni Jain](#) [[Paper](#), [Student abstract](#)].
- Improvised energy-efficient clustering & routing algorithms for Wireless Sensor Networks using modified Binary Particle Swarm Optimization, advised by [Prof. Indu S](#) and [Prof. Daya Gupta](#) [[Paper](#)].
- Designed an Intrusion detection algorithm for critical RBAC administered databases using Pattern Mining and nearest-neighbours Anomaly Detection, advised by [Ms. Indu Singh](#) [[Paper](#)].
- Investigating applications & modelling of fractional order-differential equations (FODEs) for control of infectious diseases using SVEIR models, advised by [Dr. Nilam](#) [[Report](#)].
- Distracted driver detection in real-time using a simple CNN-model. Advisors: [Dr. Rajiv Ratn Shah](#), [Dr. Yifang Yin](#) and [Dr. Roger Zimmermann](#) [[Paper](#)].

Intern December 2016
Centre for Development in Advanced Computing (CDAC), Noida, India

- Developed a Grade-1 Unified English Braille (UEB) Conversion utility in C++, potentially helping widespread adoption of UEB in India.

CONFERENCE
& JOURNAL
ARTICLES

Summary: **29 peer-reviewed publications**, including **first-author papers** at NeurIPS, ICML, and ICLR, with **300+ citations**.

** indicates equal contribution*

15. **Goswami, Mononito**, Konrad Szafer*, Arjun Choudhry*, Yifu Cai, Shuo Li, and Artur Dubrawski. “*MOMENT: A Family of Open Time-series Foundation Models*.” *International Conference on Machine Learning (ICML 2024)*. [PDF, Code, Pre-trained Model, Pre-training Dataset]
14. **Goswami, Mononito**, Vedant Sanil, Arjun Choudhry, Arvind Srinivasan, Chalisa Udompanyawit, Artur Dubrawski. “*AQuA: A Benchmarking Tool for Label Quality Assessment*.” *Neural Information Processing Systems (NeurIPS 2023) Track on Datasets and Benchmarks*. [PDF, Code] (Poster)
13. **Goswami, Mononito**, Cristian Challu, Laurent Callot, Lenon Minorics, and Andrey Kan. “*Unsupervised Model Selection for Time-series Anomaly Detection*.” *International Conference of Learning Representations (ICLR 2022)*. [PDF, Code] (Spotlight)
12. Gao, Chufan*, **Mononito Goswami***, Jieshi Chen and Artur Dubrawski. “*Classifying Unstructured Clinical Notes via Automatic Weak Supervision*.” *Machine Learning for Healthcare Conference (MLHC 2022)*. [PDF, Code]
11. Dey, Arnab, **Mononito Goswami**, Joo Heung Yoon, Gilles Clermont, Michael R. Pinsky, Marilyn Hravnak, Artur Dubrawski. “*Weakly Supervised Classification of Vital Sign Alerts as Real or Artifact*.” In *AMIA Annual Symposium Proceedings*. American Medical Informatics Association. [PDF, Code]
10. Nagpal, Chirag, **Mononito Goswami**, Keith Dufendach, and Artur Dubrawski. “*Counterfactual Phenotyping with Censored Time-to-Events*”. (2022) In *ACM Conference on Knowledge Discovery and Data Mining*. [PDF, Code]
9. **Goswami, Mononito**, Benedikt Boecking, and Artur Dubrawski. “*Weak Supervision for Affordable Modeling of ECG Data*”. (2021) In *AMIA Annual Symposium Proceedings*. American Medical Informatics Association. [PDF]
8. McReynolds, Andrew A., Sheba P. Naderzad, **Mononito Goswami**, and Jack Mostow. “*Toward Learning at Scale in Developing Countries: Lessons from the Global Learning XPRIZE Field Study*.” In *Proceedings of the Seventh ACM Conference on Learning@ Scale*, pp. 175-183. 2020. [PDF]
7. Singh, Indu, Minkush Manuja*, Rishabh Mathur*, and **Mononito Goswami***. “*Detecting intrusive transactions in databases using partially-ordered sequential rule mining and fractional-distance based anomaly detection*.” *International Journal of Intelligent Engineering Informatics* 8, no. 2 (2020): 138-171. [PDF]
6. Kaushik, Ajay*, **Mononito Goswami***, Minkush Manuja*, Indu S. and Daya Gupta. “*A Binary PSO Approach for Improving the Performance of Wireless Sensor Networks*.” *Wireless Personal Communications* (2020): 1-35. [PDF]
5. Jindal, Rajni*, Maitree Leekha*, Minkush Manuja*, and **Mononito Goswami***. “*What makes a better companion? towards social & engaging peer learning*.” In *ECAI 2020*, pp. 482-489. IOS Press, 2020. [PDF]
4. Leekha, Maitree*, **Mononito Goswami*** and Minni Jain “*A Multi-task Approach to Open Domain Suggestion Mining using Language Model for Text Over-sampling*”. In: Jose J. et al. (eds) *Advances in Information Retrieval*.

ECIR 2020. Lecture Notes in Computer Science, vol 12036. Springer, Cham [PDF]

3. **Goswami, Mononito***, Lujie Chen* and Artur Dubrawski. “*Discriminating Cognitive Disequilibrium and Flow in Problem Solving: A Semi-supervised Approach Using Involuntary Dynamic Behavioral Signals*”. Proceedings of the AAAI Conference on Artificial Intelligence. Vol. 34. 2020. [PDF]
2. Leekha, Maitree*, **Mononito Goswami***, Rajiv Ratn Shah, Yifang Yin and Roger Zimmermann. “*Are You Paying Attention? Detecting Distracted Driving in Real-time*”. Proceedings of the IEEE International Conference on Multimedia Big Data (BigMM) [PDF]
1. Mian, Shiven*, **Mononito Goswami***, and Jack Mostow. “*What’s Most Broken? Design and Evaluation of a Tool to Guide Improvement of an Intelligent Tutor*.” International Conference on Artificial Intelligence in Education. Springer, Cham, 2019 [PDF]

PEER-REVIEWED
WORKSHOP
PUBLICATIONS &
ABSTRACTS

14. Potosnak, Willa, Cristian Challu*, **Mononito Goswami***, Michał Wiliński, Nina Żukowska, and Artur Dubrawski. “*Implicit Reasoning in Deep Time Series Forecasting*.” In NeurIPS 2024 Workshop on System 2 Reasoning At Scale and NeurIPS 2024 Workshop on Time Series in the Age of Large Models.
13. Michał Wiliński, **Mononito Goswami**, Nina Żukowska*, Willa Potosnak*, and Artur Dubrawski. “*Exploring Representations and Interventions in Time Series Foundation Models*.” In NeurIPS 2024 Workshop on Fine-Tuning in Modern Machine Learning: Principles and Scalability and NeurIPS 2024 Workshop on Time Series in the Age of Large Models.
12. Żukowska, Nina, **Mononito Goswami**, Michał Wiliński, Willa Potosnak, and Artur Dubrawski. “*Towards Long-Context Time Series Foundation Models*.” In NeurIPS 2024 Workshop on Fine-Tuning in Modern Machine Learning: Principles and Scalability and NeurIPS 2024 Workshop on Time Series in the Age of Large Models.
11. Cai, Yifu, Arjun Choudhry*, **Mononito Goswami***, and Artur Dubrawski. “*TimeSeriesExam: A Time Series Understanding Exam*”. In NeurIPS 2024 Workshop on Time Series in the Age of Large Models (*Spotlight*) [PDF] and ICAIF 2024 Foundation Models for Time Series: Exploring New Frontiers Workshop (*Oral, Best Paper Honorable Mention*) [PDF] .
10. Choudhry, Arjun*, Konrad Szafer*, **Mononito Goswami**, Yifu Cai, and Artur Dubrawski. “*Datasets for Time Series Foundation Models*”. ICML 2024 Workshop on Data-Centric Machine Learning Research (DMLR 2024). 2024. [PDF]
9. Cai, Yifu, Arvind Srinivasan, **Mononito Goswami**, Arjun Choudhry, and Artur Dubrawski. “*JoLT: Jointly Learned Representations of Language and Time-Series for Clinical Time-series Interpretation*” Proceedings of the AAAI Conference on Artificial Intelligence (Student Abstract). 2024. **Best student abstract presentation award winner**. [PDF]
8. Enouen, Eric, Sebastian Caldas, **Mononito Goswami**, and Artur Dubrawski. “*PICSR: Prototype-Informed Cross-Silo Router for Federated Learning*” Proceedings of the AAAI Conference on Artificial Intelligence (Student Abstract). 2024. *3-min presentation contest finalist*.

7. Cai, Yifu, **Mononito Goswami**, Arjun Choudhry, Arvind Srinivasan and Artur Dubrawski. “*JoLT: Jointly Learned Representations of Language and Time-Series.*” Neural Information Processing Systems Workshop on Deep Generative Models for Health (DGM4H NeurIPS) (2023) (Poster).
6. Caldas, Sebastian, **Mononito Goswami** and Artur Dubrawski. “*Encoding Expert Knowledge into Federated Learning Using Weak Supervision.*” International Conference of Learning Representations Workshop on Machine Learning for IoT (ICLR ML4IoT) (2023).
5. Rooney, Sydney R, Roman Kaufman, **Mononito Goswami**, Michael R Pinsky, J. Kyle Miller, Salah Al-Zaiti, Artur Dubrawski and Gilles Clermont. “*Using Weakly Supervised Machine Learning to Label Atrial Fibrillation in Real-World Intensive Care Unit Telemetry Data.*” Circulation 146.Suppl_1 (2022): A10198-A10198.
4. **Goswami, Mononito***, Lujie Chen*, Chufan Gao and Artur Dubrawski. “*Modeling Involuntary Dynamic Behaviors to Support Intelligent Tutoring (Student Abstract)*”. Proceedings of the AAAI Conference on Artificial Intelligence. Vol. 34. 2020. [\[PDF\]](#)
3. Gao, Chufan, Fabian Falck, **Mononito Goswami**, Michael R. Pinsky, Anthony Wertz and Artur Dubrawski. “*Detecting Patterns of Physiological Response to Hemodynamic Stress via Deep Unsupervised Learning*”. Machine Learning for Health (ML4H) Workshop at NeurIPS 2019 [\[PDF\]](#)
2. Jain, Minni*, Maitree Leekha*, **Mononito Goswami***. “*A Multi-task Approach to Open Domain Suggestion Mining (Student Abstract)*”. Proceedings of the AAAI Conference on Artificial Intelligence. Vol. 34. 2020. [\[PDF\]](#)
1. **Goswami, Mononito***, Shiven Mian*, and Jack Mostow. “*What’s Most Broken? A Tool to Assist Data-Driven Iterative Improvement of an Intelligent Tutoring System.*” Proceedings of the AAAI Conference on Artificial Intelligence (Student Abstract). Vol. 33. 2019. *3-min presentation contest finalist* [\[PDF\]](#)

GUEST LECTURE
(at CMU)

- Implicit Communication and Theory of Mind (for 16-467– Human-Robot Interaction)

TEACHING
ASSISTANTSHIP
(at CMU)

- [16-811 – Math Fundamental for Robotics](#) Fall 2022
- [16-467 – Human-Robot Interaction](#) Spring 2022

INVITED TALKS

2. Why, What, and How of Graduate School Applications
 - Auton Lab RISS Interns Summer, 2022 & 2023
 - RI Climate Committee Webinar Fall, 2022
1. Time series Foundation Models– Challenges, Approaches, and Opportunities
 - [Datadog](#) November, 2024
 - [Salesforce Research Asia](#) November, 2024
 - [Commonwealth Bank of Australia](#) October, 2024
 - [US Naval Center Warfare Center - Carderock Division](#) September, 2024
 - [Forecasting Impact, Podcast](#) by International Symposium of Forecasting July, 2024
 - Prof. [Xiao Hu’s Lab](#), Emory University April, 2024
 - [CMU Flame Seminar](#) April, 2024

	<ul style="list-style-type: none"> • Gradient AI [webinar] April, 2024 • AAAI 2024 Spring Symposium on Clinical Foundation Models March, 2024
PANELS	<ol style="list-style-type: none"> 1. Panel on Foundation models for Time Series for Financial Applications at the ICAIF 2024 FM4TS Workshop November, 2024
MENTORSHIP (at CMU)	<ol style="list-style-type: none"> 10. Nina Żukowska, Robotics Institute Summer Scholar Program (RISS), <i>now</i> Master's student at FU Berlin 2024–Present 9. Michał Wiliński, RISS 2024–Present 8. Konrad Szafer, RISS 2023–2024 7. Arjun Choudhry, <i>now</i> Masters Student at CMU 2023 - Present 6. Yifu Cai, <i>now</i> Masters Student at CMU 2023 - Present 5. Eric Enouen, <i>now</i> Ph.D. student at Cornell 2023 4. Undergrad AI Mentoring Program 2021 - 2022 3. Chalisa Udompanyawit, CIT Honors Research Program 2022 - 2023 2. Arnab Dey, RISS 2021 - 2022 1. Graduate Application Support Program 2020
COMMITTEE MEMBERSHIP (at CMU)	<ol style="list-style-type: none"> 3. Willa Potosnak, Ph.D. RI 2. Xinyu (Rachel) Li, Ph.D. RI 1. Ambareesh Revanur, Masters RI, <i>now</i> Adobe MLE
ACHIEVEMENTS	<ul style="list-style-type: none"> • Secured 1.2 million in research funding through leading and contributing to successful NSF grant proposals, including SCH: Multimodal Interactive Generalist Health AI (MAGENTA) and ATD: Spatiotemporal Foundation Models for Multimodal Threat Detection at Scale. • Awarded for the best essay on <i>Goods & Services Tax</i>, its financial and technological implications, in the 2017 Indian Institute of Public Administration Essay Competition, by the <i>Vice President of India</i>. • Secured second place among 500+ teams from colleges and startups across India in a National Payments Council of India (NCPI) Hackathon. Designed an intrusion detection architecture using fuzzy logic and keystroke dynamics.
SCHOLARSHIPS	<ul style="list-style-type: none"> • Conference Travel Grants: AAAI 2024, NeurIPS 2023, Microsoft Research Travel Grant for AAAI-20, AAAI-20 Student Scholarship, National Science Foundation Student Travel Grant to attend AIED 2019

PROFESSIONAL SERVICE	<p><i>Organization</i></p> <ul style="list-style-type: none"> • Co-chaired and co-organized the highly successful [AAAI 2024 Spring Symposium on Clinical Foundation Models], attracting the highest attendance within the AAAI-2024 Spring Symposium Series. <p><i>Reviewer</i></p> <ul style="list-style-type: none"> • AAAI– 2020 • American Medical Informatics Association (AMIA) 2021 Annual Symposium • Journal of Electrocardiology • ICLR– 2025, 2024, 2023, 2022 • ICML– 2024, 2023, 2021 ML4data workshop • MLHC 2024 • NeurIPS– 2024 Main Track (Top Reviewer) & TSALM workshop, 2023 (Top Reviewer), 2022, 2021 <p><i>Admissions Committee</i></p> <ul style="list-style-type: none"> • Robotics Institute Summer Scholar (RISS) - 2020, 2021, 2022
SOCIAL OUTREACH	<ul style="list-style-type: none"> • Co-led the development of a course on Justice, Equity, Diversity and Inclusion in the Robotics Institute 2023 • As a member of the Robotics Institute Climate Committee, identified challenges in the experiences of various groups within RI and made policy recommendations to the Director to address them. 2021–Present • Mentored two undergraduate students of an underrepresented groups interested in pursuing AI research, under the CMU AI Mentoring Program. 2020–2022 • Exposed our research on RoboTutor to primary stakeholders, some 8-10 year olds from Pittsburgh schools and obtained interesting feedback for comparative cognitive processes, as a part of the Gelfand Outreach program. July 2018
PROGRAMMING	Python, PyTorch, Jax
HOBBIES	Chess, Photography, Cooking