

Mononito Goswami

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RESEARCH INTERESTS	Foundation Modeling, Modeling Structured Data (time series and tabular), Machine Learning (ML), ML for Healthcare, Weak Supervision	
EDUCATION	<i>Doctor of Philosophy in Robotics</i>	2020 - 2025 (expected)
	Carnegie Mellon University , Pittsburgh PA, USA	
	<ul style="list-style-type: none">• Doctoral Dissertation: Towards Pragmatic Time Series Intelligence• Advisor: Prof. Artur Dubrawski	
	<i>Bachelor of Technology in Computer Engineering</i>	2016 - 2020
FELLOWSHIPS	Delhi Technological University , New Delhi, India	
	<ul style="list-style-type: none">• Thesis: Towards Social & Engaging Peer Learning [Paper 1, Paper 2]	
	Centre for Machine Learning and Health (CMLH) 2021	2021 - 2022
RESEARCH EXPERIENCE	<i>Student Researcher</i>	May 2023 - Present
	Google Research, New York, USA	
	<ul style="list-style-type: none">• Machine Learning research on building, pre-training and evaluating foundation models for tabular data, along with Scott Yak, Joe Toth, Yihe Dong, Sercan Arik.	
	<i>Applied Scientist Intern</i>	May - August 2023
	Amazon Web Services AI Labs, Seattle, USA	
	<ul style="list-style-type: none">• Machine Learning research on large-scale pre-training for multi-task sample-efficient time-series modeling, along with Bariş Kurt, Andrey Kan, Gauthier Guinet, Jingchao Ni, Jonas Kübler and Laurent Callot.	
	<i>Applied Scientist Intern</i>	May - August 2022
	Amazon Web Services AI Labs, Seattle, USA	
	<ul style="list-style-type: none">• Machine Learning research on unsupervised model selection of time-series anomaly detection models, in collaboration with Andrey Kan, Lenon Minorics and Laurent Callot [Paper].	
	<i>Robotics Institute Summer Scholar</i>	June 2019 - August 2020
	Auton Lab, Carnegie Mellon University, Pittsburgh, USA	
	<ul style="list-style-type: none">• 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].	
	<i>Robotics Institute Summer Scholar</i>	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](#)].

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](#)].

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](#)
- [16-467 – Human-Robot Interaction](#)

Fall 2022

Spring 2022

CONFERENCE
ARTICLES

See also my [google scholar](#) page. * 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

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* [\[PDF\]](#)

INVITED TALKS

1. Time-series Foundation Models– Challenges, Approaches, and Opportunities
 - [Forecasting Impact, Podcast](#) by International Symposium of Forecasting July, 2024
 - Prof. [Xiao Hu’s Lab](#), Emory University April, 2024
 - [CMU Flame Seminar](#) April, 2024
 - [Gradient AI \[webinar\]](#) April, 2024
 - [AAAI 2024 Spring Symposium on Clinical Foundation Models](#) March, 2024

MENTORSHIP (at CMU)

10. Nina Zukowska, [Robotics Institute Summer Scholar Program \(RISS\)](#) 2024 - Present
9. Michal Wilinski, RISS 2024 - Present
8. Konrad Szafer, RISS 2023 - Present
7. Arjun Choudhry 2023 - Present
6. Yifu Cai 2023 - Present
5. Eric Enouen 2023

	<ol style="list-style-type: none"> Undergrad AI Mentoring Program Chalisa Udompanyawit, CIT Honors Research Program Arnab Dey, RISS Graduate Application Support Program 	<p>2021 - 2022</p> <p>2022 - 2023</p> <p>2021 - 2022</p> <p>2020</p>
COMMITTEE MEMBERSHIP (at CMU)	<ol style="list-style-type: none"> Angela H. Chen, Ph.D. RI Willa Potosnak, Ph.D. RI Xinyu (Rachel) Li, Ph.D. RI Ambareesh Revanur, Masters RI 	
WORK EXPERIENCE	<p><i>Equity Research Intern</i></p> <p>Phillip Capital, Mumbai, India</p> <p>December 2017</p> <ul style="list-style-type: none"> Carried out a study on disruptive technology like Blockchain & edge-computing that can potentially transform the <i>FinTech</i> sector. <p><i>Intern</i></p> <p>Goods & Services Tax Network (GSTN), New Delhi, India</p> <p>June - July 2017</p> <ul style="list-style-type: none"> Designed the Analytics & Risk Management framework along with consultants from PwC, Infosys and State Tax departments. Co-developed a simplified tool for tax submissions for the pan-India GST roll out. <p><i>Intern</i></p> <p>Centre for Development in Advanced Computing (CDAC), Noida, India</p> <p>December 2016</p> <ul style="list-style-type: none"> Developed a Grade-1 Unified English Braille (UEB) Conversion utility in C++. This work helped would help in implementation of UEB in India. 	
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 significant attendance within the AAAI Spring Symposium Series. 	

Reviewer

- 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, 2023 (Top Reviewer), 2022, 2021, TSALM workshop

Admissions Committee

- Robotics Institute Summer Scholar (RISS) - 2020, 2021, 2022

SOCIAL OUTREACH

- 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 - Present
- 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, L^AT_EX

HOBBIES Chess, Photography, Cooking