

Mononito Goswami

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

RESEARCH INTERESTS	Weak Supervision, Time-series Analysis, Machine Learning (ML), ML for Healthcare, Education, and Public Policy	
EDUCATION	<i>Doctor of Philosophy in Robotics</i>	2020 - 2025 (expected)
	Carnegie Mellon University , Pittsburgh PA, USA	
	<ul style="list-style-type: none">• Advisor: Prof. Artur Dubrawski• Fellowship: Centre for Machine Learning and Health	
	<i>Bachelor of Technology in Computer Engineering</i>	2016 - 2020
	Delhi Technological University , New Delhi, India	
	<ul style="list-style-type: none">• Thesis: Towards Social & Engaging Peer Learning [Paper 1, Paper 2]• Advisor: Prof. Rajni Jindal	
RESEARCH EXPERIENCE	<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 data-efficient time-series, along with Barış 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	
	<ul style="list-style-type: none">• 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].	
	<i>Undergraduate Researcher</i>	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](#) Fall 2022
- [16-467 – Human-Robot Interaction](#) Spring 2022

CONFERENCE
ARTICLES

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

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

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 (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* [\[PDF\]](#)

MENTORSHIP (at CMU)

- | | |
|---|----------------|
| 6. Arjun Chowdhary | 2023 - Present |
| 5. Yifu Cai | 2023 - Present |
| 4. Undergrad AI Mentoring Program | 2021 - Present |
| 3. Chalisa Udompanyawit, CIT Honors Research Program | 2022 - Present |
| 2. Arnab Dey, Robotics Institute Summer Scholar Program | 2021 - 2022 |
| 1. Graduate Application Support Program | 2020 |

COMMITTEE MEMBERSHIP (at CMU)

2. [Xinyu \(Rachel\) Li](#), Ph.D. RI
1. [Ambareesh Revanur](#), Masters RI

WORK EXPERIENCE

Equity Research Intern December 2017
Phillip Capital, Mumbai, India

- Carried out a study on disruptive technology like Blockchain & edge-computing that can potentially transform the *FinTech* sector. [\[Report\]](#)

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

- 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. [\[Report\]](#)[\[Letter of Commendation\]](#)

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

- Developed a Grade-1 Unified English Braille (UEB) Conversion utility in C+++. This work helped would help in implementation of UEB in India. [\[Report\]](#)

ACHIEVEMENTS

- Successfully led a team of scholars to facilitate the publication of the Robotics Institute Summer Scholars [Working Papers Journal 2019](#).
- Successfully completed the *Educational Data Mining track* of the Simon Initiative [LearnLab Summer School](#) organised by Carnegie Mellon University, in 2018 and 2019. Mined tutor logs from RoboTutor to analyze *backing-out* from activities.
- [Awarded](#) for the best essay on *Goods & Services Tax*, its financial and technological implications, in the 2017 Indian Institute of Public Administration Essay Competition, by the *Vice President of India*.
- Stood **second** among 500 college teams and start-ups from all over India in a Hackathon organized by [National Payments Council of India](#) for designing an intrusion detection architecture using Fuzzy Logic & keystroke dynamics.

FELLOWSHIPS	Center for Machine Learning and Health (CMLH)	2021 - 2022
SCHOLARSHIPS	<ul style="list-style-type: none"> • Microsoft Research Travel Grant to attend AAAI-20 • AAAI-20 Student Scholarship • National Science Foundation Student Travel Grant to attend AIED 2019 	
PROFESSIONAL SERVICE	<p><i>Reviewer</i></p> <ul style="list-style-type: none"> • NeurIPS-2022, 2021 • ICLR-2023, 2022 • AAAI-2020 • ICML-2023, 2021 ML4data workshop • American Medical Informatics Association (AMIA) 2021 Annual Symposium • Journal of Electrocardiology <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"> • 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, C/C++, MySQL, HTML, \LaTeX	
HOBBIES	Chess, Photography, Cooking, Pranayama Yoga	