

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

- **Advisor:** [Prof. Artur Dubrawski](#)
- **Fellowship:** [Centre for Machine Learning and Health](#)

Bachelor of Technology in Computer Engineering 2016 - 2020
Delhi Technological University, New Delhi, India

- **Thesis:** Towards Social & Engaging Peer Learning [[Paper 1](#), [Paper 2](#)]
- **Advisor:** [Prof. Rajni Jindal](#)

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

- Machine Learning research on 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](#)].

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].

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

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*. [PDF] (Spotlight)
12. Gao, Chufan*, **Mononito Goswami***, Jieshi Chen and Artur Dubrawski. “Classifying Unstructured Clinical Notes via Automatic Weak Supervision.” *Machine Learning for Healthcare Conference*. [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 [\[PDF\]](#)

MEDICAL ABSTRACTS

1. 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.

STUDENT ABSTRACTS

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)

- | | |
|---|----------------|
| 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	<i>Equity Research Intern</i> Phillip Capital, Mumbai, India	December 2017
	<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. [Report] 	
	<i>Intern</i> Goods & Services Tax Network (GSTN), New Delhi, India	June - July 2017
	<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. [Report][Letter of Commendation] 	
	<i>Intern</i> Centre for Development in Advanced Computing (CDAC), Noida, India	December 2016
	<ul style="list-style-type: none"> Developed a Grade-1 Unified English Braille (UEB) Conversion utility in C++. <p>This work helped would help in implementation of UEB in India. [Report]</p>	
ACHIEVEMENTS	<ul style="list-style-type: none"> Successfully led a team of scholars to facilitate the publication of the Robotics Institute Summer Scholars Working Papers Journal 2019. Successfully completed the <i>Educational Data Mining track</i> of the Simon Initiative LearnLab Summer School organised by Carnegie Mellon University, in 2018 and 2019. Mined tutor logs from RoboTutor to analyze <i>backing-out</i> from activities. 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>. 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	<i>Reviewer</i>	
	<ul style="list-style-type: none"> NeurIPS-2021, 2022 ICLR-2022, 2023 AAAI-2020 ICML-2021 ML4data workshop American Medical Informatics Association (AMIA) 2021 Annual Symposium, Journal of Electrocardiology 	
	<i>Admissions Committee</i>	
	<ul style="list-style-type: none"> 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, C/C++, MySQL, HTML, \LaTeX

HOBBIES Chess, Photography, Cooking, Pranayama Yoga