

# Mononito Goswami

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## CONTACT INFORMATION

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

✉ mgoswami [at] andrew.cmu.edu

## EDUCATION

**Carnegie Mellon University (CMU)** Pittsburgh PA, USA

*Doctor of Philosophy in Robotics*

September 2020 – 2025 (expected)

**CGPA: 4.0/4.0**

**Advisor:** [Prof. Artur Dubrawski](#)

**Fellowship:** [Centre for Machine Learning and Health](#)

**Relevant Coursework:** Adv. Intro. to Machine Learning, Math Fundamentals for Robotics, Probabilistic Graphical Models, Intermediate Statistics, Machine Learning Ethics & Society, Convex Optimization, Causal Inference, Computer Vision

**Delhi Technological University (DTU)** New Delhi, India

*Bachelor of Technology in Computer Engineering*

August 2016 – June 2020

**CGPA: 9.11/10**

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

**Advisor:** [Prof. Rajni Jindal](#)

**Relevant Coursework:** Evolutionary & Swarm Computing, Machine Learning, Artificial Intelligence, Natural Language Processing, Data Structures, Algorithm Design & Analysis, Theory of Computation, Data Warehousing & Mining

## RESEARCH EXPERIENCE

**Amazon Web Services AI Lab, Amazon** Seattle, USA

*Applied Scientist Intern*

May 2022 - August 2022

Machine Learning research on unsupervised model selection of time-series anomaly detection models.

**Auton Lab, Carnegie Mellon University** Pittsburgh, USA

*Graduate Research Assistant*

August 2020 - Present

Machine Learning research on weak supervision for healthcare applications.

**Auton Lab, Carnegie Mellon University** Pittsburgh, USA

*Robotics Institute Summer Scholar*

June 2019 - August 2020

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](#)]

**RoboTutor Project, Carnegie Mellon University** Pittsburgh, USA

*Robotics Institute Summer Scholar*

June 2018 - September 2020

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](#)]

**Delhi Technological University**, New Delhi, India

Analyzing dyadic interactions between young children to identify non-verbal cues that aid effective story-telling. Advisor: [Prof. Rajni Jindal](#). [[Paper 1](#), [Paper 2](#)] 2020

Developed a Multi-task Learning approach for Open Domain Suggestion Mining and a novel language model-based text over-sampling method. Advisor: [Ms. Minni Jain](#). [[Paper](#), [Student abstract](#)] 2019


Improvised energy-efficient clustering & routing algorithms for Wireless Sensor Networks using modified Binary Particle Swarm Optimization. Advisors: [Prof. Indu S](#) and [Prof. Daya Gupta](#). [[Paper](#)] 2017-2019

Designed an Intrusion detection algorithm for critical RBAC administered databases using Pattern Mining and nearest-neighbours Anomaly Detection. Advisor: [Ms. Indu Singh](#). [[Paper](#)] 2017-2019

Investigating applications & modelling of fractional order-differential equations (FODEs) for control of infectious diseases using SVEIR models. Advisor: [Dr. Nilam](#). [[Report](#)] 2017

Distracted driver detection in real-time using a simple CNN-model. Advisors: [Dr. Rajiv Ratn Shah](#), [Dr. Yifang Yin](#) and [Dr. Roger Zimmermann](#). [[Paper](#)] 2019

## PUBLICATIONS

\* indicates equal contribution,  indicates journal articles


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


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]

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]

**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]

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]

 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].

 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]

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]

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]

**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]

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]

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]

STUDENT  
ABSTRACTS

**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]

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]

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]

**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]

WORKING PAPERS	<b>Goswami, Mononito*</b> , Chufan Gao*, Benedikt Boecking, Saswati Ray and Artur Dubrawski. “ <i>Active Refinement of Weakly Supervised Models.</i> ” <i>In Submission.</i> (2022) [ <a href="#">PDF</a> ]	
	<b>Goswami, Mononito</b> , Benedikt Boecking, Patrick J. Coppler, Jonathan Elmer and Artur Dubrawski. “ <i>Towards Knowledge-driven Clinical Data Annotation Quality Assessment.</i> ” <i>In Submission.</i> (2021)	
	 <b>Goswami, Mononito*</b> , Minkush Manuja*, and Maitree Leekha*. “ <i>Towards Social &amp; Engaging Peer Learning: Predicting Backchanneling and Disengagement in Children.</i> ” <i>In Submission.</i> (2021) [ <a href="#">PDF</a> ]	
WORK EXPERIENCE	<b>Phillip Capital</b> Mumbai, India <i>Equity Research Intern</i> December 2017 Carried out a study on disruptive technology like Blockchain & edge-computing that can potentially transform the <i>FinTech</i> sector. [ <a href="#">Report</a> ]	
	<b>Goods &amp; Services Tax Network (GSTN)</b> New Delhi, India <i>Summer Intern</i> June - July 2017 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. [ <a href="#">Report</a> ][ <a href="#">Letter of Commendation</a> ]	
	<b>Centre for Development in Advanced Computing (CDAC)</b> Noida, India <i>Winter Intern</i> December 2016 Developed a Grade-1 Unified English Braille (UEB) Conversion utility in C++. This work helped would help in implementation of UEB in India. [ <a href="#">Report</a> ]	
	<b>ACHIEVEMENTS</b> Successfully led a team of scholars to facilitate the publication of the Robotics Institute Summer Scholars <a href="#">Working Papers Journal</a> 2019. Successfully completed the <i>Educational Data Mining track</i> of the Simon Initiative <a href="#">LearnLab Summer School</a> 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 &amp; 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 <b>second</b> among 500 college teams and start-ups from all over India in a Hackathon organized by <a href="#">National Payments Council of India</a> for designing an intrusion detection architecture using Fuzzy Logic & keystroke dynamics.	
SCHOLARSHIPS	<a href="#">Centre for Machine Learning and Health</a> , Microsoft Research Travel Grant, AAAI-20 Student Scholarship, National Science Foundation Student Travel Grant to attend AIED 2019.	
PROFESSIONAL SERVICE	<i>Reviewer</i> <a href="#">Journal of Electrocardiology</a> , NeurIPS-2022, ICLR-2021, AAAI-2020, <a href="#">Journal of Educational Data Mining (JEDM)</a> , <a href="#">American Medical Informatics Association (AMIA)</a> 2021 Annual Symposium, ICML 2021 ML4data workshop, Neural Information Processing Systems (NeurIPS)-2021	
	<i>Admissions Committee</i> Robotics Institute Summer Scholar (RISS)-2020, 2021, 2022	
	<i>Mentorship</i> <a href="#">CIT Honors Research Program</a> (Fall 2022-Present), <a href="#">RISS</a> (CMU RI, Summer’21), <a href="#">Graduate Application Support Program</a> (CMU SCS, Fall’20)	
SOCIAL OUTREACH	As a member of the Robotics Institute Climate Committee, identified undue challenges in the experiences of various groups within RI and made policy recommendations to the Director to address them.	

Mentored two undergraduate students of an underrepresented groups interested in pursuing AI research, under the CMU AI Mentoring Program. October 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, L<sup>A</sup>T<sub>E</sub>X

HOBBIES Chess, Photography, Cooking, Pranayama Yoga