Mononito Goswami

Contact Information

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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, 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

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*

Goswami, Mononito, Benedikt Boecking, and Artur Dubrawski. "*Weak Supervision for Afordable Modeling of ECG Data.*". (2021) In *AMIA Annual Symposium Proceedings.* American Medical Informatics Association. [Paper]

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

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 Submission.* (2021) [PDF]

Gao, Chufan*, **Mononito Goswami***, Jieshi Chen and Artur Dubrawski. "*Classifying Unstructured Clinical Notes via Automatic Weak Supervision.*" *In Submission.* (2021) [PDF]

Goswami, Mononito*, Chufan Gao*, Benedikt Boecking, Saswati Ray and Artur Dubrawski. "*Active Refinement of Weakly Supervised Models.*" *In Submission.* (2021) [PDF]

Goswami, Mononito, Benedikt Boecking, Patrick J. Coppler, Jonathan Elmer and Artur Dubrawski. "*Towards Knowledge-driven Clinical Data Annotation Quality Assessment.*" *In Submission.* (2021) [PDF]

Goswami, Mononito*, Minkush Manuja*, and Maitree Leekha*. "*Towards Social & Engaging Peer Learning: Predicting Backchanneling and Disengagement in Children*". *In Submission.* (2021) [PDF]

Work Experience

Phillip Capital Mumbai, India
Equity Research Intern December 2017
Carried out a study on disruptive technology like Blockchain & edge-computing that can potentially transform the *FinTech* sector. [Report]

Goods & Services Tax Network (GSTN) New Delhi, India
Summer Intern 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. [Report][Letter of Commendation]

Centre for Development in Advanced Computing (CDAC) Noida, India
Winter Intern 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. [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.

Scholarships

Microsoft Research Travel Grant, AAAI-20 Student Scholarship, National Science Foundation Student Travel Grant to attend AIED 2019.

Professional Service

Reviewer
ICLR-2021, AAAI-2020, Journal of Educational Data Mining (JEDM), American Medical Informatics Association (AMIA) 2021 Annual Symposium, ICML 2021 ML4data workshop, Neural Information Processing Systems (NeuRIPS) - 2021

Admissions Committee
Robotics Institute Summer Scholar (RISS)-2020, RISS-2021

Mentorship
RISS (CMU RI, Summer'21), Graduate Application Support Program (CMU SCS, Fall'20)

Social Outreach

Mentored an undergraduate student of an underrepresented group interested in pursuing AI research, under the CMU AI Mentoring Program. October 2020

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

Took remedial classes in mathematics and science for some children in middle school in the Khora village, India. 2014

Programming

Python, C/C++, MySQL, HTML, LaTeX

Hobbies

Chess, Photography, Cooking, Pranayama Yoga