Pratheeksha (Isha) Nair

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TECHNICAL SKILLS

- **Natural Language Processing** – Named entity recognition (NER), topic modeling, text classification, sequence-to-sequence modeling, LLM few-shot prompting, fine-tuning
- **Machine Learning** – Weak supervision, graph neural networks (GNNs), large language models (LLMs), contrastive learning, data efficient learning
- **Data Engineering** – Synthetic dataset generation, data augmentation, and self-supervised learning for structured and unstructured data
- **Tools and Frameworks** – PyTorch, TensorFlow, Hugging Face, Scikit-Learn, NumPy, Pandas, Plotly Dash

EDUCATION

Degree	University	Specialization	Year	Total
PhD	McGill University, Canada	Computer Science	2019-2025	3.87/4.0
Integrated Master's	IIIT Bangalore, India	Computer Science Engineering	2014-2019	3.6/4.0

PROFESSIONAL EXPERIENCE

- **Mila - Quebec AI Institute** (Sep, 2025 - present) - *Research Assistant*
  - Building hybrid graph + LLM reasoning prototypes to improve multi-step inference in fact checking
  - Secured project funding through two successful grant applications
- **Material Legal** (Feb, 2025 - Dec, 2025) - *Named Entity Recognition*
  - Improved XBRL tagging on financial documents by 10% through bert-based models
  - Scraped, cleaned and curated an in-house database of SEC filings along with data analysis tools
- **NoriSpace** (June, 2024 - Sep, 2024) - *Computer Vision & Image Splicing*
  - Implemented an automatic fraud detection system for low-quality insurance claim images in Korean
  - Developed a self-supervised method for identifying image splicing with 70% accuracy
- **IBM Research Lab Bangalore** (May, 2018 - Aug, 2018) - *Sequence-to-sequence modeling*
  - Automated method name generation from method body for code summarization
  - Implemented a sequence-to-sequence model trained on small Java function body to generate function name with 45% BLEU score

SELECTED RESEARCH PROJECTS

- **Weak Supervision for Graphs** *(Self-Supervised Learning)*
  - Achieved 10% improvement in organized crime detection precision
  - Leveraged LLM predictions for graph learning and improved misinformation detection by 5%
- **Weakly Supervised Graph Learning for Combatting Human Trafficking** *(Weak Supervision)*
  - Improved detection of suspicious activity by 7% by combining GNNs and weak labels
  - Synthetically generated a dataset using GPT3.5-turbo, tackling data scarcity in the domain
- **Extracting Person Names from User-generated Text** *(Named Entity Recognition)*
  - Improved SOTA name extraction by 19%
  - Combined 10 fine-tuned language models with classic rule-based matching using an HMM-based weak supervision framework
- **Mortality Prediction on Electronic Health Records** *(Topic Modeling)*
  - Improved accuracy by 5% through a novel multi-modal topic model
  - Collaborated with a multi-disciplinary team involving clinicians, bioinformaticians and computer scientists
- **Improving Validity of Machine Generated Drugs** *(Generative Modeling)*
  - Improved the validity of generated drugs using generative models like VAE by 5%
  - Proposed a novel training strategy involving a validity checker from RDKit library

SELECTED PUBLICATIONS

- **Pratheeksha Nair**, Gabriel Lefebvre, Sophia Garrel, Maryam Molamohammadi, & Reihaneh Rabbany. Reframing AI-for-Good: Radical Questioning in AI for Human Trafficking Interventions. In *Proceedings of the AAAI/ACM Conference on AI, Ethics, and Society* (AIES 2025)

- **Pratheeksha Nair**, Gabriel Lefebvre, Sophia Garrel, Maryam Molamohammadi, & Reihaneh Rabbany. Ask before you build: Rethinking AI-for-good in human trafficking interventions. *4th Workshop on Ethical Artificial Intelligence: Methods and Applications* (ACM SIGKDD 2025)
- **Pratheeksha Nair**, Javin Liu, Catalina Vajiac, Andreas Olligschlaeger, Duen Horng Chau, Mirela Cazzolato, Cara Jones, Christos Faloutsos, Reihaneh Rabbany. T-NET: Weakly Supervised Graph Learning for Combatting Human Trafficking, *Proceedings of the AAAI Conference on Artificial Intelligence (AAAI 2024)*
- Javin Liu, Hao Yu, Vidya Sujaya, **Pratheeksha Nair**, Kellin Pelrine, Reihaneh Rabbany. SWEET-Weakly Supervised Person Name Extraction for Fighting Human Trafficking, *Findings of the Association for Computational Linguistics: (EMNLP 2023)*
- **Pratheeksha Nair**, Yifei Li, Catalina Vajiac, Andreas Olligschlaeger, Meng-Chieh Lee, Namyong Park, Duen Horng Chau, Christos Faloutsos, Reihaneh Rabbany. VisPaD: Visualization and Pattern Discovery for Fighting Human Trafficking, *Companion Proceedings of the Web Conference (2022)*
- Yifei Li, **Pratheeksha Nair**, Kellin Pelrine, Reihaneh Rabbany. Extracting Person Names from User Generated Text: Named-Entity Recognition for Combating Human Trafficking, *Findings of the Association for Computational Linguistics: (ACL 2022)*
- Wen, Zhi, **Pratheeksha Nair**, Chih-Ying Deng, Xing Han Lu, Edward Moseley, Naomi George, Charlotta Lindvall, and Yue Li. Mining heterogeneous clinical notes by multi-modal latent topic model, *PloS one 16, no. 4 (2021)*
- Yue Li, **Pratheeksha Nair**, Zhi Wen, Imane Chafi, et al, Global Surveillance of COVID-19 by mining news media using a multi-source dynamic embedded topic model, *ACM Conference on Bioinformatics, Computational Biology and Health Informatics (ACM-BCB 2020)*
- Yue Li, **Pratheeksha Nair**, Xing Han Lu, Zhi Wen, Yuening Wang, et al, Inferring multimodal latent topics from electronic health records, *Nature Communications volume 11, Article number: 2536 (2020)*

ACHIEVEMENTS

- **Graduate Research Enhancement and Travel (GREAT) Award** (2025) - Awarded by the School of Computer Science, McGill University to support conference-related travel.
- **Fonds de recherche du Quebec (FRQNT) Scholarship** (2023) - Awarded a doctoral training scholarship by the Quebec government for a 7 semester period.
- **3rd place in DataJam against Exploitation** (Summer 2021) - Led a team of 5 which won the 3rd place in the 2021 DataJam against Exploitation organized by the ICPC, the Human Trafficking and Migrant Smuggling Section of the UN, Fundación Pasos Libres and IBM Corporate Social Responsibility.
- **Computer Science Teaching Assistant Award** (Fall 2020, McGill University) – Recognized for inspiring and challenging undergraduate students. One among 45 TAs nominated for the award by students.
- **Dean's Merit List** (IIIT-B, 2019) – Recognized for academic excellence on graduating with 3.6/4.0 GPA.
- **GHCI Student Scholar 2018** – Scholarship to attend India's largest gathering of women technologists produced by AnitaB.org and ACM India.
- **World Rank 23/1500** (Adobe CODHERS Codesprint 2016) – 21^{st} place in India
- **World Rank 49/2500** (Women's CodeSprint 2016) – 19^{th} place in India
- **World Rank 7/1000+** (HackerRank Women's Cup 2015) – 3^{rd} place in India.

LEADERSHIP EXPERIENCE

- **Supervision (2022 - 2024)**
  - Mentored a graduate student on a project that led to a poster presented at Algorithmic Fairness through the Lens of Metrics and Evaluation (Neurips 2024)
  - Co-supervised 3 interns on projects related to Anti Human Trafficking leading to publishing in top tier venues like EMNLP 2023
- **Head of events and Mentor - WISR India (2019 - 2023)**
  - Designed, planned and organized events for WISR (Women in STEM Research) India
  - Mentor in the WISR mentorship program for young Indian women undergraduates interested in exploring research in STEM
- **VP Finance at McGill Chapter for Scientista (Fall 2020 - Winter 2021)**
  - Managed finance and audits for the Scientista chapter at McGill
- **Mentor at Office for Student Disabilities (OSD) at McGill University (Fall 2020, Winter 2021, Summer 2021)**
  - Selected to become a mentor for two students registered in OSD on their daily academic life
- **Teaching Assistant (2018-2020)**
  - Held tutorial sessions for Introduction to Computer Systems (Winter & Fall 2020 at McGill University)
  - Conducted tutorial sessions, developed and graded projects for ML 101 (2018 at IIITB) and Programming Languages (2019 at IIITB)