Mehak Gupta

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Homepage
in,

Research Interest

My research interest is in Artificial Intelligence (AI) and its interdisciplinary applications. Within AI, I am interested in problems related to natural language processing, representation learning, predictive modeling with supervised and semi-supervised deep learning models, and digital transformation with applications in healthcare and other domains. I am also interested in improving the fairness and explainability of AI systems to enhance their usability and adaptability.

Professional Experience

2023-Present **Assistant Professor**, *Southern Methodist University*.

2021–2022 **Data Science Fellow**, *Data Innovation Lab, Delaware, USA*.

2019–2021 **Research Assistant**, *University of Delaware, USA*.

2018–2019 **Teaching Assistant**, *University of Delaware, USA*.

2014–2017 **Associate Consultant**, *Software AG, Bangalore*.

2010–2012 **System Engineer**, *Infosys Ltd, Pune*.

Education

2018 – 2023 **PhD., Computer Science**, *University of Delaware (4.0 GPA)*.
Thesis Title: Deep Learning Predictive Modelling for Electronic Health Record (*Completed*)
Advisor: Prof. Rahmatollah Beheshti

2012–2014 **Masters in Engineering, Software Engineering**, *Thapar University, India*.
Graduation grade: 8.85 GPA

2006–2010 **Bachelors of Engineering, Computer Engineering** , *Punjabi University, India* .
Graduation grade: 73%

Publications [Google Scholar Profile]

Conferences .

ML4H '2022 **Mehak Gupta**, *Brennan Gallamoza, Nicolas Cutrona, Pranjal Dhakal, Raphael Poulain, and Rahmatollah Beheshti.*, **"An Extensive Data Processing Pipeline for MIMIC-IV"**, In Proceedings of the 2nd Machine Learning for Health symposium, volume 193 of Proceedings of Machine Learning Research, pages 311–325. PMLR. Acceptance Rate: 28/85. View.

MLHC '2022 Raphael Poulain**, Mehak Gupta**, *Rahmatollah Beheshti.*, **"Few-Shot Learning with Semi-Supervised Transformers for Electronic Health Records"**, Machine Learning for Healthcare Conference, pages 1–21, 2022. Acceptance Rate: 33/104. View.

IAAI '2021 **Mehak Gupta**, *Raphael Poulain, Thao-Ly T Phan, H Timothy Bunnell and Rahmatollah Beheshti.*, **"Flexible-window Predictions on Electronic Health Records"**, In Proceedings of the AAAI Conference on Artificial Intelligence, 36(11):12510-12516. Acceptance Rate: 22%. View.

IEEE-BIBM '2021 Raphael Poulain**, Mehak Gupta**, *Thao-Ly T Phan, H Timothy Bunnell and Rahmatollah Beheshti.*, **"Transformer-based Multi-target Regression on Electronic Health Records for Primordial Prevention of Cardiovascular Disease"**, In Proceedings of the IEEE International Conference on Bioinformatics and Biomedicine (BIBM). Acceptance Rate: 19%. View.

ACM-BCB '2021 **Mehak Gupta**, *Thao-Ly T Phan, H Timothy Bunnell and Rahmatollah Beheshti.*, **"Concurrent Imputation and Prediction on EHR data using Bi-Directional GANs"**, In Proceedings of the 12th ACM International Conference on Bioinformatics, Computational Biology and Health Informatics. Acceptance Rate: 23%. View.

Elsevier '2014 **Mehak Gupta**, *R. Aggarwal*, **"Transforming Relational Database to Graph Database Using Neo4j"**, In Proceedings of the Second International Conference on Emerging Research in Computing, Information, Communication and Applications, Bangalore, India.

Journals .

ACM-Health '2021 **Mehak Gupta**, *Thao-Ly T Phan, H Timothy Bunnell and Rahmatollah Beheshti.*, **"Obesity prediction with ehr data: A deep learning approach with interpretable elements"**, ACM Transactions on Computing for Healthcare (HEALTH), 3(3):1–19, 2022. Impact factor: 2.38. View.

Under Review

Journal **Mehak Gupta**, *Thao-Ly T Phan, F´elice L^e-Scherban, Daniel Eckrich, H Timothy Bunnell and Rahmatollah Beheshti.*, **"Associations of longitudinal BMI percentile classification patterns in early childhood with neighborhood-level social determinants of health"**, medRxiv 2023 View.

Journal **Mehak Gupta**, *Thao-Ly T Phan, F´elice L^e-Scherban, Daniel Eckrich, H Timothy Bunnell and Rahmatollah Beheshti.*, **"Towards more reliable risk estimation of childhood obesity using AI-based methods on unaugmented EHRs"**.

Teaching Experience

Fall 2023 **Instructor**, *Department of Computer Science, Southern Methodist University*, Operating System (2 Sections), Enrollment:66.

Fall 2022 **Substitute Instructor**, *Department of Computer and Information Sciences, University of Delaware*, Facilitated classes in absence of the instructor for .
- "INTRODUCTION TO ARTIFICIAL INTELLIGENCE" (Course Code: CISC681)

Spring 2019 **Substitute Instructor**, *Department of Computer and Information Sciences, University of Delaware*, Facilitated classes in absence of the instructor for .
- "INTRO TO SOFTWARE ENGINEERING" (Course Code: CISC275)

Fall 2018 - Spring 2019 **Graduate Teaching Assistant**, *Department of Computer and Information Sciences, University of Delaware*, Led weekly labs, guided and provided assistance to students during laboratory/office hours. Explained concepts, graded assignments and final exams for .
- "INTRO TO SOFTWARE ENGINEERING" (Course Code: CISC275)
- "MACH ORGANZTN & ASSEMBLY LANG" (Course Code: CISC260)

Spring 2013 **Lab Instructor**, *Department of Computer and Information Sciences, Thapar University*, Led weekly labs, guided and provided assistance to students during laboratory hours. Created lab assignments and exams and conducted final vocabulary tests for.
- "Introduction to Relational Databases"

Honors and Awards

2022 **Frank A. Pehrson Graduate Student Award for Outstanding Computer Science Research**, *Awarded by Graduate College, University of Delaware.*

2022 **Professional Development Travel Award**, *Awarded by Graduate College, University of Delaware to travel to a conference for poster presentation.*

2022 **Travel Award**, *Awarded by Machine learning for Health Conference..*

2022 **Dissertation Fellowship**, *Awarded by Graduate College, University of Delaware in recognition of the top doctoral students across campus based on nominations from graduate programs and recommendations from a faculty review committee. .*

2021, 2022 **CRA-W Travel Scholarship**, *Awarded by Computing Research Association Women to attend Grad Cohort Workshop, 2021, 2022.*

2020 **Distinguished Graduate student Award** , *Awarded by CIS, University of Delaware CIS 2020 in recognition of graduate students who distinguished themselves through exceptional scholarship, research and noteworthy performance in leadership and service..*

Research Presentations

2022 **An Extensive Data Processing Pipeline for MIMIC-IV**, *Machine learning for Health Conference Poster Presentation, In-Person.*

2022 **Deep Learning Predictive Modelling for Electronic Health Records**, *University of Delaware, PhD Proposal Presentation Talk, via Zoom.*

2021 **Flexible-window Predictions on Electronic Health Records**, *AAAI Conference on Artificial Intelligence, Paper Presentation Talk, via Zoom.*

2021 **Concurrent Imputation and Prediction on EHR data using Bi-Directional GANs**, *12th ACM International Conference on Bioinformatics, Computational Biology and Health Informatics, Paper Presentation Talk, via Zoom.*

2021 **Deep Learning for Obesity Prediction using Electronic Health Records**, *CRA-W Grad Cohort Workshop, Poster Presentation Talk, via Zoom.*

2020 **Obesity Prediction with EHR Data: A Deep Learning Approach with Interpretable Elements**, *University of Delaware, PhD Prelims Presentation Talk, via Zoom.*

2019 **A Survey of Deep Learning Techniques in EHR Prediction Modelling**, *Series of Special Interest Group in Artificial Intelligence, University of Delaware, Presentation Talk, Newark, USA.*

Undergraduate/Graduate Student Mentoring

Under the supervision and collaboration with my advisor Prof. Rahmat Beheshti, served as graduate research mentor for three undergraduate and three graduate students in performing EHR data analysis and developing models for disease outcome prediction. Collaborated in designing research projects, worked closely with students to guide them through the research process, designing and implementing an approach, evaluating the approach, and presenting their research in paper.

2022 Haritima Manchanda, *Developed in-house pipeline to transform OMOP-EHR data to FHIR and develop proof-of-concept SMART-FHIR app to showcase output of EHR data prediction models.*

2022 Brennan Gallamoza, Pranjal Dhakal, Nicolas, Cutrona, *Co-authored a research paper "An Extensive Data Preprocessing Pipeline for MIMIC-IV" (accepted).*

2021 Raphael Poulain, *Provided guidance on pre-processing techniques and evaluating an approach and presenting in a research paper (accepted).*

2021 Raphael Poulain, *Introduced to the EHR data and provided guidance on implementing and evaluating an approach and presenting in a research paper. (accepted).*

Service to Profession

2023 **Reviewer**, *IEEE-BHI Journal (4 papers).*

2023 **Reviewer**, *Machine Learning 4 Health 2022 (5 papers).*

2022 **Reviewer**, *ACM-CHIL 2023 (4 papers).*

2022 **Reviewer**, *NeurIPS Workshop TS4H 2022 (3 papers).*

2022 **Reviewer**, *Machine Learning 4 Health 2022 (3 papers).*

2022 **Senator**, *Graduate Student Government, University of Delaware.* , Served Student Life committee to promote better graduate life for students who are parents..

2022 **Research Grant Contributor**, *Participated in discussion and writing of "Responsible AI to combat childhood obesity", with PI Rahmat Beheshti, "NIH (R01)".*

2022 **Sub-Reviewer**, *ACM-Conference on Bioinformatics, Computational Biology, and Health Informatics (1 paper).*

2022 **Reviewer**, *ACM-Conference on Health, Inference and Learning (3 papers).*

2021 **Lead Mentor**, *EmPOWER University of Delaware*, Provide mentorship to graduate students joining Computer and Information Sciences. Planned events to build community and share resources to ease transition to graduate school.

2020–2023 **Webmaster**, *Women in Engineering, University of Delaware*, Provide supportive community for all women in STEM and planned events and maintained website for the committee.

2020 **Reviewer**, *Journal of Childhood Obesity (1 paper).*

Professional Memberships and Affiliations

2022 **Senator**, *Graduate Student Government, University of Delaware.*

2021–2022 **Data Science Institute Fellow**, *University of Delaware.*

2021 **CIS Representative**, *Student Advisory Committee, College of Engineering, University of Delaware.*

2020–2023 **CIS Representative**, *Women in Engineering, University of Delaware.*

2020–2022 **Peer/Lead Mentor**, *EmPOWER CIS, University of Delaware.*

Technical Skills

Programming	Python | R | Keras | PyTorch | tensorflow | Java | R shiny | SQL
Machine Learning	Neural Networks | Recurrent Neural Network | Attention Models | Convolutional Neural Network | Regression | Random Forest | k-means | Gradient Boosting | Generative Adversarial Network
Certifications	Oracle Certified Professional JAVA SE 6 Programmer | Coursera Introduction to Data Science with Python | Coursera Applied Machine Learning with Python | Coursera Text Mining with Python