Mehak Gupta

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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**, *Tech Impact, Delaware, USA*.
2019–2021	**Graduate 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%

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 Funding

Awarded Proposals.

2023 **Data Science Grant**, *Southern Methodist University.*
Title: Training and evaluation of large language models for psychological assessment
PI: Josh Oltmanns, Co-PI: Mehak Gupta
Total Award Amount:$34,000

Publications [Google Scholar Profile]

Conference Publications

2024 Fahmida Liza Piya,**Mehak Gupta**, *and Rahmatollah Beheshti.*, **"HealthGAT: Node Classifications in Electronic Health Records using Graph Attention Networks"**, IEEE/ACM International Conference on Connected Health: Applications, Systems and Engineering Technologies (CHASE).

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

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

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

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

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

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.

Journal Publications

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.

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Under Review

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

Talks and Presentations

Invited Talks

2023 **Deep Learning Predictive Modelling for Electronic Health Records**.
Data Science Cluster Meetup, Southern Methodist University

2023 **Prediction Models in healthcare Domain**.
Big Data Advisory Board Meetup, Southern Methodist University

2023 **Deep Learning Models in Healthcare Domain**.
Southern Methodist University

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.*

Teaching Experience

Department of Computer Science, Southern Methodist University

Spring 2024 **Instructor**, Operating System, Enrollment:108.

Fall 2023 **Instructor**, Operating System, Enrollment:66.

Department of Computer and Information Sciences, University of Delaware

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"

Student Research Mentoring

Dissertation/Candidacy Committee Member

2023-Present	Leon Yuan, Department of Statistical Science, Southern Methodist University

PhD Students

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.

2023	Fahmida Liza Piya, *Co-authored a research paper "HealthGAT: Node Classifications in Electronic Health Records using Graph Attention Networks"* (accepted).
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).

Masters Students

2024	**Nikkie Hooman**, *Southern Methodist University*. Building AI Clinical Prediction Models using Structured and Unstructured EHR Data
2024	**Rasiq Hussain**, *Southern Methodist University*. Training LLM for Personality Prediction in Clinical Psychology

Undergraduate Students

2024	**Jerry Ma**, *Southern Methodist University*. Training LLM for Personality Prediction in Clinical Psychology

Service to Profession

Journal/Conference Reviewer

2023	**Reviewer**, *IEEE-BHI Journal (1 paper)*.
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)*.
2020	**Reviewer**, *Journal of Childhood Obesity (1 paper)*.

	Department and University Service Activities at Southern Methodist University
2023-Present	Quantum Engineering Faculty Search Committee
	Diversity and Outreach Activities
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.

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