

# FAHIM ANZUM

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Ph.D. Candidate, Computer Science, University of Calgary, Canada

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## RESEARCH SUMMARY

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My research explores how linguistic, affective, and psychological traits evolve across human-authored and LLM-generated texts, and how these trajectories can be modeled using deep learning to support explainable and trustworthy human-AI interaction.

## EDUCATION

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**Ph.D., Computer Science** Jun 2026 (Expected)

University of Calgary (UCalgary), Calgary, Alberta

**Committee:** Marina L. Gavrilova, Usman Alim, Michael Ullyot,  
Mario Costa Sousa, Ehud Sharlin

**Ph.D. Thesis:** Trajectory-Based Modeling of Human and AI-Generated Language  
for Trustworthy and Explainable Decision-Making

**M.Sc., Computer Science** Aug 2021

University of Calgary, Calgary, Alberta

**Advisors:** Mario Costa Sousa, Usman Alim

**M.Sc. Thesis:** Exploring Convolutional Neural Networks and Transfer Learning  
for Oil Sands Drill Core Image Analysis

**B.Sc., Computer Science and Engineering** Jan 2018

Military Institute of Science and Technology (MIST)

Bangladesh University of Professionals (BUP), Dhaka, Bangladesh

**Advisors:** Muhammad Nazrul Islam, Wali Mohammad Abdullah

## RESEARCH EXPERIENCE

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**Biometric Technologies Lab, University of Calgary, Canada** Sep 2021 – Present

**Role: Graduate Assistant – Research**

- Spearheaded the development of **EmoBlend Fusion**, an interpretable hybrid model for emotion detection, establishing a foundation for **trustworthy and explainable human-machine teaming**
- Published in leading journals and conferences (IEEE Transactions, IEEE Access, ACM, Springer), advancing explainability and trust in AI-driven decision making
- Led transdisciplinary collaborations with **Alberta Health Services, Cumming School of Medicine, Department of Political Science**, and the **School of Public Health**, bridging AI research with applications in healthcare, governance, and public policy
- **Mentored and supervised** graduate and undergraduate students, guiding them through experimental design, implementation, and manuscript development, resulting in student awards and publications in IEEE Access, Springer Nature, and IEEE ICCI\*ICC
- **Contributed to grant writing and proposal development** aligned with national and institutional AI and social innovation initiatives, supporting multi-disciplinary research funding
- **Organized and coordinated** academic events, including workshops and seminars, to promote knowledge exchange in **Ethical Social Media Data Mining**

### Peer-reviewed Conference, Journal, and Book Chapter Papers 🏠

- [17] **Fahim Anzum** and Marina L. Gavrilova. “EmoBlend Fusion: Towards Trustworthy Human-Machine Teaming through Enhanced Emotion Detection in Microblogs.” under review in *IEEE Transactions on Human-Machine Systems*, 2026.
- [16] Lily Dey, **Fahim Anzum**, Ulises Charles-Rodriguez, A S M Hossain bari, Jean-Christophe Boucher, Aleem Bharwani, Marina L. Gavrilova. “Exploring Public Trust Through LLM-Driven Opinion Mining” in *International Conference on Computer Information Systems and Industrial Management (CISIM 2025)*, pp. 59-74, Springer Nature, 2025. [pdf]
- [15] Pedro Paiva, Farzaneh Dehghani, **Fahim Anzum**, Mansi Singhal, Ayah Metwali, Marina Gavrilova, Mariana Bento. “FairHealthGrid: A Systematic Framework for Evaluating Bias Mitigation Strategies in Healthcare Machine Learning” in *31st Americas Conference on Information Systems (AMCIS, 2025)*, Vol. 46, 2025. [pdf]
- [14] Farzaneh Dehghani, Mahsa Dibaji, **Fahim Anzum**, Lily Dey, Alican Basdemir, Sayeh Bayat, Jean-Christophe Boucher, Steve Drew, Sarah Elaine Eaton, Richard Frayne, Gouri Ginde, Ashley Harris, Yani Ioannou, Catherine Lebel, John Lysack, Leslie Salgado Arzuaga, Emma Stanley, Roberto Souza, Ronnie de Souza Santos, Lana Wells, Tyler Williamson, Matthias Wilms, Zaman Wahid, Mark Ungrin, Marina Gavrilova, Mariana Bento. “Trustworthy and Responsible AI for Human-Centric Autonomous Decision-Making Systems” accepted in *Transactions on Machine Learning Research*, 2025. [pdf]
- [13] **Fahim Anzum** and Marina L. Gavrilova. “EmoBlend Fusion: Leveraging Handcrafted and Deep Features for Emotion Detection.” in *IEEE International Conference on Human-Machine Systems (ICHMS 2024)*, pp. 1-6. [pdf] [Best Student Paper] 🏆
- [12] **Fahim Anzum**, Ashratuz Zavín Asha, Lily Dey, Artemy Gavrilov, Fariha Iffath, Abu Quwsar Ohi, Liam Pond, Md Shopon, Marina L Gavrilova. “A Comprehensive Review of Trustworthy, Ethical, and Explainable Computer Vision Advancements in Online Social Media.” in *Global Perspectives on the Applications of Computer Vision in Cybersecurity*, 2024, pp. 1-46. [pdf]
- [11] **Fahim Anzum** and Marina L. Gavrilova. “Emotion Detection From Micro-Blogs Using Novel Input Representation.” in *IEEE Access*, Vol 11, 2023, pp. 19512-19522. [pdf]
- [10] Zaman Wahid, ASM Hossain Bari, **Fahim Anzum** and Marina. L. Gavrilova, “Human Micro-Expression: A Novel Social Behavioral Biometric for Person Identification,” in *IEEE Access*, Vol 11, 2023, pp. 57481-57493. [pdf]
- [9] **Fahim Anzum**, Hamidreza Hamdi, Usman Alim, Mario Costa Sousa, “Exploring Convolutional Neural Networks and Machine Learning for Oil Sands Drill Core Image Analysis,” in *EAGE Digitalization Conference and Exhibition*, 2023, pp. 1-5. [pdf]
- [8] Marina L Gavrilova, **Fahim Anzum**, ASM Hossain Bari, Yajurv Bhatia, Fariha Iffath, Quwsar Ohi, Md Shopon, Zaman Wahid, “A multifaceted role of biometrics in online security, privacy, and trustworthy decision making.” in *Breakthroughs in Digital Biometrics and Forensics*, Cham: Springer International Publishing, 2022, pp. 303-324. [pdf]
- [7] **Fahim Anzum**, Ashratuz Zavín Asha, Marina L. Gavrilova. “Biases, fairness, and implications of using AI in social media data mining.” in *IEEE International Conference on Cyberworlds (CW 2022)*, pp. 251-254. [pdf]
- [6] Kaitlin De Chastelain Finnigan, **Fahim Anzum**, Jon Rokne, Marina L Gavrilova, “Weighted Lexicon-based Sentiment Analysis for Women Career Traits in Information Technology.” in *IEEE International Conference on Cognitive Informatics & Cognitive Computing (ICCI\* CC 2022)*, pp. 91-98. [pdf] [Best Paper Award] 🏆

- [5] Ashratuz Zavin Asha, **Fahim Anzum**, Patrick Finn, Ehud Sharlin, Mario Costa Sousa, “Designing External Automotive Displays: VR Prototypes and Analysis”, in *ACM International Conference on Automotive User Interfaces and Interactive Vehicular Applications (AutoUI 2020)*, pp. 74-82. [\[pdf\]](#)
- [4] Ashratuz Zavin Asha, **Fahim Anzum**, SM Faisal Rahman, Muhammad Nazrul Islam, Mehreen Hoque, “Towards Developing an Intelligent Fire Exit Guidance System Using Informed Search Technique”, in *International Conference of Computer and Information Technology (ICCIT 2018)*, pp. 1-6. [\[pdf\]](#)
- [3] Adnan Sharif, **Fahim Anzum**, Ashratuz Zavin Asha, Sayma Alam Suha, Anika Ibnat, Muhammad Nazrul Islam, “Exploring the Opportunities and Challenges of Adopting Augmented Reality in Education in a Developing Country”, in *IEEE International Conference on Advanced Learning Technologies (ICALT 2018)*, pp. 364-366. [\[pdf\]](#)
- [2] Fahim Ahmed, **Fahim Anzum**, Muhammad Nazrul Islam, Wali Mohammad Abdullah, Sazid Al Ahsan, Moneruzzaman Rana, “A new algorithm to compute single source shortest path in a real edge weighted graph to optimize time complexity”, in *IEEE International Conference on Computer and Information Science (ICIS 2018)*, pp. 185-191. [\[pdf\]](#)
- [1] **Fahim Anzum**, Fahim Ahmed, M Shariful Azim, Mosaddek Hossain, Shifat Zaman, Farhan Hasib, Sazid Al Ahsan, “Smart self position aligning chair for a modern conference room.”, in *IEEE International Conference on Computer and Information Science (ICIS 2018)*, pp. 263-268. [\[pdf\]](#)

## TEACHING EXPERIENCES

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**University of Calgary, Canada**

*Sep 2019 – Present*

**Role: Sessional Instructor, Dept. of CS**

*Taught 160+ Undergrad Students*

- Conducted an introductory **Python** programming course—**CPSC 231: Introduction to Computer Science for Computer Science Majors I**
- Developed course outline, designed lecture materials, and delivered bi-weekly lectures integrating interactive demonstrations and live coding sessions
- Conducted in-class activities, programming assignments, and examinations to assess conceptual and practical understanding
- Provided mentorship and academic support during weekly office hours, fostering an inclusive and engaging learning environment
- Supervised multiple TAs, ensuring alignment in grading, tutorial quality, and student feedback
- Coordinated a guest lecture and industry networking session, fostering knowledge exchange between students and professionals from academia and industry

**Role: Graduate Assistant - Teaching, Dept. of CS**

*Taught 400+ Undergrad and Grad Students*

- Conducted tutorials and lab sessions for undergraduate and graduate courses, including:
  - CPSC 217: Introduction to Computer Science for Multidisciplinary Studies I
  - CPSC 319: Data Structures, Algorithms, and Their Application
  - Data 604: Working with Data at Scale
  - Data 201: Thinking with Data
- Prepared tutorials, supplementary materials, and grading rubrics to support student learning
- Provided academic mentorship and one-on-one assistance during weekly office hours

- Served as Head TA in multiple courses, coordinating TA activities and ensuring consistent grading and instructional quality

**United International University and Primeasia University, Bangladesh** *Mar 2018 - Aug 2019*

**Role: Course Instructor/ Lecturer, Dept. of CSE**

*Taught 800+ undergrad students*

- Conducted undergraduate-level theory and sessional courses, including:
  - CSE 421/422: Computer Graphics (Theory and Lab)
  - CSE 427/428: Graph Theory (Theory and Lab)
  - CSE 323: Software Engineering
  - CSE 107: Introduction to Computers
  - CSE 110: Computer Fundamentals Lab
  - CSE 211: Discrete Mathematics
  - CSE 415: Computer Networks
- Designed course outlines and assessments, evaluating students through in-class activities, presentations, quizzes, midterms, final exams, and project-based learning
- Completed faculty development and mentorship training programs to enhance pedagogical effectiveness
- Supervised undergraduate capstone projects, guiding students in conducting research and preparing manuscripts for publication
- Served as an Organizing and Logistics Sub-Committee Member for the 21st IEEE ICCIT 2018, Dhaka, Bangladesh

## INDUSTRY EXPERIENCES

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**Suncor Energy Inc., Canada**

Sep 2019 – Aug 2021

- Conducted applied research under the **Mitacs-Accelerate Graduate Research Program**, developing computer vision and machine learning models to advance data-driven geoscience solutions
- Pioneered the development of a hybrid ML–CNN model for facies and grain size prediction, achieving a 20% performance improvement over Suncor’s existing system
- Supervised a team of five geologists in data collection, annotation, and preprocessing of proprietary oil sands drill core imagery for model training
- Led a multidisciplinary team of over ten geoscientists and engineers to evaluate model generalizability, interpretability, and integration feasibility within Suncor’s analytics pipeline
- Presented research outcomes to Suncor’s data science and R&D leadership, contributing to the company’s digital transformation and intelligent analytics initiatives

**Global Voice Telecom Limited, Bangladesh**

Dec 2016 – Jan 2017

- Intern/ Undergraduate Industrial Trainee, Technology Division
- Obtained hands-on experience on monitoring Voice over Internet Protocol (VoIP)

## SCHOLARSHIPS, AWARDS AND HONORS

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- **Open Doctoral Scholarship, Faculty of Graduate Studies, University of Calgary**  
*Amount: CA\$15,000, effective from January 2026*
- **Best Student Paper Award (Top 3), IEEE ICHMS, 2024**

- **Best Paper Award, IEEE ICCI\*CC**, 2022
- **Alberta Innovates Scholarship** by the Government of Alberta, 2021  
*Amount: CA\$124,000 over four years*
- **Eyes High International Doctoral Recruitment Scholarship** by UCalgary, 2021  
*Amount: CA\$60,000 for four years*
- **Mitacs-Accelerate Graduate Research Internship** by UCalgary, 2019  
*Amount: CA\$50,000*
- **Graduate Research Award** by UCalgary, Dept. of Computer Science, 2020  
*Amount: CA\$11,000*
- **International Graduate Tuition Award** by UCalgary, 2021  
*Amount: CA\$12,000 for four years*
- **International Graduate Recruitment Award** by UCalgary, 2019  
*Amount: CA\$2,000*
- **Visa Differential Scholarship** by UCalgary, 2019  
*Amount: CA\$4,126.17*
- **Commandant's List Award** by MIST, the most prestigious recognition for maintaining a GPA over 3.80 in the academic year, 2015 and 2016
- **National Merit Scholarship** by the Bangladesh Government, (2008, 2010, 2012)
- **National Secondary School Merit Scholarship** by Bangladesh Government, 2010
- **National High School Merit Scholarship** by Bangladesh Government, 2008

## ACADEMIC SERVICES

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### Academic Hiring Committee

- Served as the graduate student representative for the tenure-track research stream faculty hiring committee in the Computer Science Department of the University of Calgary, Spring 2024

### Reviewer: Conferences, Journals

- ACM KDD: Workshop on Generative AI for Recommender Systems and Personalization: Papers, 2024
- ACM CHI: Late Breaking Works, 2024
- IEEE Access: Regular Papers, 2022, 2023, 2024
- Springer, the Visual Computer: Regular Papers, 2024
- Springer Transactions on Computational Science, Papers, 2022, 2023, 2024
- IEEE ICCSA: Papers, 2022, 2023
- Springer Nature book proposal on "Biases and ethics in social intelligence".

### Conference Program Committee

- Technical Program Committee Member of 12th International Symposium on Applied Computing for Software and Systems (**ACSS**), to be held on July 4-5, 2025, in Kolkata, India
- Organizing and Logistics Sub-Committee Member of the IEEE 21st International Conference on Computer and Information Technology (**ICCIT**), 2018, Dhaka, Bangladesh

## Student Volunteers

- ACM DIS 2023, Pittsburgh, USA

## University Services: University of Calgary

- Academic Event Committee Member | Graduate Student's Association (GSA) Sep 2022 – Apr 2023
- Vice-President Communications | Computer Science Graduate Society (CSGS) Apr 2023 – Apr 2024
- Judge | CalgaryHacks, Competitive Programming Contest Feb 2022

## MENTORING

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- Lily Dey | Master's student, Dept. of CS, UCalgary Jan 2024 – Present
- Wamika Jha | Master's student, Dept. of CS, UCalgary May 2024
- Zaman Wahid | Master's Student, Dept. of CS, UCalgary Jan 2022 – Jun 2023
- Kaitlin De Chastelain Finnigan | Bachelor's Student, Dept. of CS, UCalgary Jun 2022 – Dec 2022

## SELECTED INVITED TALKS, SEMINARS, AND POSTERS

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- Guest Lecture** | United International University, Bangladesh Jan 2023  
**Talk:** Ethics in Online Social Media Data Mining
- Poster Presentation** | University of Calgary, Canada Sep 2022  
**Poster:** AI in Social Media Data Mining: Viewing Through the Lens of Ethical Aspects [URL]
- Guest Lecture** | Bournemouth University, England Sep 2022  
**Talk:** Deep Learning in Social Media Opinion Mining
- Guest Lecture** | DATA 501 - Data Science Capstone, University of Calgary, Canada Jul 2022  
**Talk:** Introduction to Deep Learning and Convolutional Neural Networks
- Invited Talk** | Visualization and Graphics Group, University of Calgary, Canada Jul 2022  
**Talk:** Drill Core Image Classification using Convolutional Neural Networks
- M.Sc. Grad Seminar** | University of Calgary, Canada Jul 2021  
**Talk:** Exploring Transfer Learning and Convolutional Neural Networks for Predicting Mean Grain Size from Oil Sands Drill Core Images

## TECHNICAL SKILLS

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- Programming and Frameworks:** Python, PyTorch, TensorFlow, scikit-learn, Hugging Face Transformers, NumPy, Pandas, Matplotlib, Seaborn, Java (Object Oriented Programming)
- Machine Learning and AI:** Deep Learning, Natural Language Processing (NLP), Large Language Models (LLMs), Explainable AI (XAI), Trustworthy AI, Emotion Detection, Bias and Fairness Mitigation
- Data Science and Analytics:** Data Mining, Feature Engineering, Statistical Modeling, Topic Modeling (BERTopic, LDA), Data Visualization, Sentiment Analysis, Social Media Analytics