FAHIM ANZUM

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

Ph.D. candidate in Computer Science with a strong research record in trustworthy and explainable artificial intelligence, and over eight years of university-level teaching experience. Research focuses on modeling the temporal dynamics of language and emotion in human- and LLM-generated social media text, with applications to misinformation detection, human-AI interaction, and responsible decision-making. Experienced in designing interpretable hybrid deep learning architectures that integrate linguistic, affective, and behavioral traits, and in translating research into practice through interdisciplinary collaborations. Committed to research-informed teaching, student mentorship, and academic service.

EDUCATION

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

PUBLICATIONS

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 Zavin 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 Zavin 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]

RESEARCH EXPERIENCE

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, contributing to research on **trustworthy and explainable human–AI interaction**
- Published in leading journals and conferences (IEEE Transactions, IEEE Access, TMLR, 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 in experimental design, technical implementation, and academic writing, with mentees contributing to peer-reviewed publications and receiving student research awards
- Contributed to grant writing and proposal development aligned with national and institutional priorities in AI and social innovation
- Organized and coordinated academic workshops and seminars focused on ethical and responsible social media data mining

TEACHING EXPERIENCE

Teaching Scope: Core computer science and data science courses at introductory, intermediate, and advanced undergraduate levels, with graduate-level instruction, mentoring, and instructional leadership experience.

University of Calgary, Canada Sep 2019 – Present
Sessional Instructor, Department of Computer Science
Course Ownership | Undergraduate | Enrollment: 160+

- Independently designed and delivered an introductory Python programming course (**CPSC 231: Introduction to Computer Science for Computer Science Majors I**), emphasizing algorithmic thinking, problem decomposition, and code readability
- Developed course outlines, lecture materials, assignments, labs, and examinations, integrating live coding, interactive demonstrations, and in-class activities to support diverse learning styles
- Implemented formative and summative assessments to reinforce conceptual understanding and support progressive skill development in programming
- Mentored students through structured office hours and individualized feedback, fostering an inclusive, supportive, and engaging learning environment
- Supervised and coordinated multiple teaching assistants, ensuring consistency in grading practices, tutorial delivery, and instructional quality across course components
- Organized a guest lecture and industry networking session to connect course content with real-world applications and professional pathways

Graduate Teaching Assistant / Head TA, Department of Computer Science
Undergraduate and Graduate Instruction | Enrollment: 400+

- Led 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
- Designed tutorial materials, supplementary resources, and grading rubrics to align instructional activities with course learning objectives
- Served as Head TA in multiple courses, coordinating TA teams, managing grading workflows, and maintaining instructional consistency across large course sections
- Provided academic mentoring and one-on-one student support during weekly office hours

United International University and Primeasia University, Bangladesh Mar 2018 - Aug 2019
Lecturer, Department of Computer Science and Engineering
Undergraduate Instruction | Enrollment: 800+

- Independently taught undergraduate theory and laboratory courses, including:
  - Computer Graphics (Theory and Lab)
  - Graph Theory (Theory and Lab)
  - Software Engineering
  - Discrete Mathematics
  - Computer Networks
  - Introduction to Computers and Computer Fundamentals Lab
- Designed course outlines, lectures, and assessments using a mix of project-based learning, presentations, quizzes, midterms, final exams, and lab-based evaluation
- Supervised undergraduate capstone projects, mentoring students in research design, technical implementation, and academic writing
- Completed faculty development and mentorship training programs to strengthen pedagogical practice and instructional effectiveness

INDUSTRY EXPERIENCE

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

- **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 SERVICE

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 & SUPERVISION

Mentored students in research design, technical implementation, academic writing, and professional development, with mentees contributing to peer-reviewed publications and conferences.

- 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

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

Programming: Python, PyTorch, TensorFlow, scikit-learn, Hugging Face Transformers, NumPy, Pandas, Matplotlib, Seaborn, Java for Objective Oriented Programming

Machine Learning and NLP: Deep Learning, Natural Language Processing (NLP), Large Language Models (LLMs), Explainable and Trustworthy AI, Affective Computing, Social Computing, AI Fairness, Topic Modeling, Statistical Modeling, Feature Engineering