Shahin Atakishiyev

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RESEARCH INTERESTS

Research interests focus on developing safe, ethical, human-centered, and explainable artificial intelligence (XAI) approaches to real-world problems. Current research is centered on applying XAI, Vision-Language Foundation Models to autonomous driving and various downstream vision and natural language processing tasks.

EDUCATION

PhD in Computing Science   Sep. 2019 - Sep. 2024
University of Alberta   Edmonton, Canada
- Thesis: Development of Explainable Artificial Intelligence Approaches for Autonomous Vehicles
  Nominated for the Outstanding PhD Thesis Award
  Supervisor: Prof. Randy Goebel

MSc in Computer Engineering   Jan. 2016 - Jan. 2018
University of Alberta   Edmonton, Canada
- Thesis: Evaluation of High-Dimensional Word Embeddings using Cluster and Semantic Similarity Analysis
  Supervisor: Prof. Marek Reformat

BSc in Computer Engineering   Sep. 2010 - Jun. 2015
Qafqaz University   Baku, Azerbaijan

Full Secondary Education   Sep. 1999 - May. 2010
Mirzabayli Village Full Secondary School   Gabala, Azerbaijan

PUBLICATIONS

7. Shahin Atakishiyev, Mohammad Salameh, Randy Goebel. **Safety Implications of Explainable Artificial Intelligence in End-to-End Autonomous Driving**. *Under review in IEEE Transactions on Intelligent Transportation Systems, 2024.* [PDF]

6. Shahin Atakishiyev, Mohammad Salameh, Hengshuai Yao, Randy Goebel. **Explainable Artificial Intelligence for Autonomous Driving: A Comprehensive Overview and Field Guide for Future Research Directions**. *IEEE Access, Vol. 12, pp. 101603-101625, 2024.* [PDF]

5. Shahin Atakishiyev, Mohammad Salameh, Randy Goebel. **Incorporating Explanations into Human-Machine Interfaces for Trust and Situation Awareness in Autonomous Vehicles**. In *2024 IEEE Intelligent Vehicles Symposium, Jeju, South Korea, pp. 2948-2955, 2024.* [PDF]

4. Shahin Atakishiyev, Mohammad Salameh, Housam Babiker, Randy Goebel. **Explaining Autonomous Driving Actions with Visual Question Answering**. In *2023 IEEE 26th International Conference on Intelligent Transportation Systems (ITSC), Bilbao, Spain, pp. 1207–1214, 2023.* [PDF]

3. Shahin Atakishiyev, Mohammad Salameh, Hengshuai Yao, Randy Goebel. **Towards Safe, Explainable, and Regulated Autonomous Driving**. *In Explainable AI for Intelligent Transportation Systems, pp. 32-52, 2023.* [PDF] (Presented a shorter version of this paper orally in AAAI-2022 as well.)

2. Mi-Young Kim, Shahin Atakishiyev, Housam Babiker, Nawshad Farruque, Randy Goebel, Osmar R. Zaïane, Mohammad Motallebi, Juliano Rabelo, Talat Syed, Hengshuai Yao, Peter Chun. **A Multi-Component Framework for the**

Analysis and Design of Explainable Artificial Intelligence, *Machine Learning and Knowledge Extraction, 3(4), pp. 900-921. 2021.* [PDF]

1. Shahin Atakishiyev and Marek Reformat. **Analysis of Word Embeddings Using Fuzzy Clustering**, *Recent Developments and the New Direction in Soft-Computing Foundations and Applications, pp. 539-551, 2021.* [PDF]

WORK EXPERIENCE	**Deep Learning Researcher** Huawei Technologies Canada Co., Ltd.	Oct. 2024 - Present Edmonton, Canada

WORK EXPERIENCE

Deep Learning Researcher   Oct. 2024 - Present
Huawei Technologies Canada Co., Ltd.   Edmonton, Canada
- Working on VLMs for downstream vision tasks.

Postdoctoral Fellow   Oct. 2024 - Present
Department of Computing Science, University of Alberta   Edmonton, Canada
- Investigating local explainability and mechanistic interpretability of LLMs.

PhD Research Intern   May 2023 - Aug. 2023
Huawei Technologies Canada Co., Ltd.   Edmonton, Canada
- Built an LLM for faithful robotic task planning with a group of five people and wrote a technical report of the project for internal use.

Research Assistant   May 2019 - Aug. 2019
Centre for Smart Transportation, University of Alberta   Edmonton, Canada
- Investigated motion planning approaches for autonomous driving.

Machine Learning Engineer   Mar. 2019 - Aug. 2019
Long Tail Financial Corp.   Edmonton, Canada
- Developed a data visualization dashboard in Python for systematic trading of assets in emerging markets.

Machine Learning Engineer   Feb. 2018 - Oct. 2018
AltaML Inc.   Edmonton, Canada
- Analyzed large drilling and construction datasets using Python and built predictive models for the relevant tasks.

Software Engineer   Feb. 2015 - Aug. 2015
MedEffect Digital Clinic   Baku, Azerbaijan
- Built an electronic health records (EHR) system for the clinic using PHP, HTML, JavaScript, and MySQL with a team of four people.

Software Engineer Intern   Apr. 2014 - Jul. 2014
ATL Tech   Baku, Azerbaijan
- Developed an online donation system using ASP.NET, C#, HTML, JavaScript, and MySQL with a team of four people.

PRESENTATIONS & SEMINARS

- ***Invited Speaker***   *Sep. 2024*
  Delivered a talk at the Smart Mobility Workshop of the IEEE ITSC-2024 Conference as an Invited Speaker in Edmonton, Canada.

- ***Invited Speaker***   *Sep. 2024*
  Gave a lecture on the future of autonomous driving as an Invited Speaker in CMPUT 495 - Honors Seminar, a class of nearly 200 students, at the University of Alberta.

- ***Guest Speaker*** *Jan. 2024*
  Gave a seminar on XAI and human-machine interface-guided situation awareness framework for autonomous driving for the Interactive Robotics Group of the CSAIL lab at the Massachusetts Institute of Technology (MIT).

- ***Invited Speaker*** *Jan. 2023*
  Gave a seminar on the interpretability of reinforcement learning for autonomous driving for the Safe RL group at the Technical University of Munich.

- ***Featured Panelist*** *Oct. 2022*
  Delivered a talk on principles of ethical AI in AI4Society's Ethical Data and AI Salon.

- ***Presenter*** *Aug. 2022*
  Presented my ongoing research on XAI approaches for autonomous driving at the University of Alberta-Huawei Joint Innovation Collaboration (UAHJIC) Workshop in Edmonton, Canada.

- ***Presenter*** *Aug. 2022*
  Presented my ongoing research on XAI approaches for autonomous driving in the Reinforcement Learning Seminar Series in the Department of Computing Science at the University of Alberta.

- ***Poster Presenter*** *May 2022*
  Presented a poster on a learning framework for safety and compliance verification of autonomous driving in AI Week in Edmonton, Canada.

- ***Poster Presenter*** *Feb. 2022*
  Presented a conceptual framework for explainable autonomous driving at the AI4Society's Reverse EXPO Workshop.

- ***Presenter*** *Jun. 2021*
  Gave a talk on explainable reinforcement learning-based framework for compliance testing of autonomous vehicles at the 2nd Autonomous Systems Initiative Symposium in Edmonton, Canada.

- ***Presenter*** *Oct. 2020*
  Gave a talk on a framework for the regulation of autonomous systems based on explainable reinforcement learning and prediction as knowledge at the 1st Autonomous Systems Initiative Symposium in Edmonton, Canada.

TEACHING EXPERIENCE

Course Instructor Fall 2022
Azerbaijan State Oil and Industry University (online) Edmonton, Canada
- Taught the NLP 3101: Natural Language Processing course (online from Edmonton, Canada) to MSc students, a class of 17 students.

Teaching Assistant Winter 2022
Department of Computing Science, University of Alberta Edmonton, Canada
- Prof. Osmar Zaiane and Sadaf Ahmed's Teaching assistant (TA) for CMPUT 175: Introduction to the Foundations of Computation II, a class of more than 650 students.

Teaching Assistant Fall 2019
Department of Computing Science, University of Alberta Edmonton, Canada
- Prof. Russell Greiner's TA for the CMPUT 463/563: Probabilistic Graphical Models, a senior undergraduate/graduate level course of more than 30 students.

ACADEMIC SERVICE	**Peer Reviewer**	Mar. 2020 - Present
	Department of Computing Science, University of Alberta	Edmonton, Canada

- Journal of Machine Learning Research
- Journal of Artificial Intelligence Research
- Artificial Intelligence Review
- Engineering Applications of Artificial Intelligence
- Expert Systems with Applications journals
- IEEE Transactions on Intelligent Transportation Systems
- IEEE Transactions on Intelligent Vehicles
- IEEE International Conference on Intelligent Transportation Systems
- IEEE Intelligent Vehicles Symposium

	Publicity Director	May 2022 - Aug. 2022
	Department of Computing Science, University of Alberta	Edmonton, Canada

- Promoted different academic events to the students and the Department as a Publicity Director of the Computing Science Graduate Students' Association (CSGSA). Maintained the CSGSA's website.

TECHNICAL STRENGTH

- **Programming**: Python, Java, R, MATLAB, HTML, JavaScript
  Deep Learning Frameworks: PyTorch, TensorFlow, Keras, OpenCV

HONORS & AWARDS

- **Sep. 2024:** A nominee for the 2024 Outstanding PhD Thesis Award at the University of Alberta
- **Jan. 2024:** Graduate Student Travel Award for academic travel to MIT (a one-time payment award of $1,500)
- **Nov. 2023:** The Alberta Graduate Excellence Scholarship (AGES) (a one-time payment award of $12,000)
- **Feb. 2022:** AAAI-2022 Conference Presentation Award (a one-time payment award of $250)
- **May 2020:** Doctoral Scholarship by the Ministry of Science and Education of the Republic of Azerbaijan (May 2020 - Aug. 2024) (monthly stipend, full tuition fee)
- **Mar. 2019:** Doctoral Funding by the Department of Computing Science of the University of Alberta (Sep. 2019 - Aug. 2024) (monthly stipend through research and teaching assistantship)
- **Sep. 2015:** Master's Scholarship by the Ministry of Science and Education of the Republic of Azerbaijan (Jan. 2016 - Jan. 2018)(monthly stipend, full tuition fee)

PROFESSIONAL AFFILIATIONS

- AAAI Student Member (Dec. 2020 - Present)
- IEEE Student Member (Sep. 2017 - Present)

Last updated on Oct 20, 2024.