

Amir Nazemi, Ph.D.

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EDUCATION

- **Postdoctoral Researcher** University of Waterloo, Canada
Systems Design Engineering 2024 – present
Sport Analytics Research Group, Homography estimation, Puck detection, Player action recognition, Game event detection
- **Postdoctoral Researcher** University of Waterloo, Canada
Systems Design Engineering 2023 – 2024
AI for Medical Data, Diffusion Models for Inverse Problems, Video Understanding, AI for Dietary Data
- **Doctor of Philosophy (Ph.D.)** University of Waterloo, Canada
Systems Design Engineering 2019 – 2023
Thesis: Continual Learning-based Video Object Segmentation
GPA: 91/100
- **Master of Science (M.Sc.)** Shiraz University, Iran
Artificial Intelligence 2011 – 2014
Thesis: Object Recognition via Sparse Coding
GPA: 90/100
- **Bachelor (B.Sc.)** Shahid Bahonar University of Kerman, Iran
Computer Software Engineering 2006 – 2010
Thesis: Multi-National Particle Swarm Optimization Algorithm
GPA: 78/100

TEACHING EXPERIENCE AND CERTIFICATES

- **University of Waterloo** Waterloo, Canada
Lecturer 2022
 - Statistical Image Processing and Multidimensional Modeling (SYDE 672)
 - * Graduate level course for PhD and M.Sc students.
 - * Course perception surveys scores: 4.1/5.
 - * Inverse problems, multidimensional modeling, large-scale statistical problems, generative models
- **University of Waterloo** Waterloo, Canada
Center for Teaching Excellence (CTE) 2021 - 2022
 - Fundamentals of University Teaching (FUT) Certificate.
 - * Three microteaching sessions.
 - * Six workshops: Teaching methods; Effective lesson plan; Supporting student mental health; Shaping classroom dynamics; Social anxiety in classroom; Statements of teaching philosophy.
- **University of Waterloo** Waterloo, Canada
Teaching Assistant 2020 - 2022
 - Linear Signals and System – BME 252 - [Spring 2022].
 - Algorithms and Data Structures – MTE140 - [Winter 2022].
 - Linear Signals and System – SYDE 252 - [Fall 2021].
 - Linear Signals and System – BME 252 - [Spring 2021].
 - Intro to Complex Systems - SYDE 532 - [Winter 2021].
 - Digital Computation - SYDE 121 - [Fall 2020].

- Pattern Recognition - SYDE 675 - [Winter 2020].

- **Shiraz University**

Shiraz, Iran

Teaching Assistant

2012 - 2016

- Advanced Pattern Recognition [Spring 2016].
- Computer Vision [2014 - 2015].
- Statistical Pattern Recognition [Fall 2012].

AWARDS

- **Best Paper Award in the Hockey Analytics Conference** Linköping, Sweden.
Buzko K., Nazemi A., Clausi DA., Chen Y. Ice Hockey Action Recognition via Contextual Priors. 2025
- **International Doctoral Student Award** Waterloo, Canada
By University of Waterloo. 2019 - 2023
- **CVPR Challenge Finalist** Virtual
Tong J, Nazemi A, Shafiee M, Fieguth P. CLVision 2020 Challenge Solution. 2020
- **Iran Police National Traffic Safety Award** Tehran, Iran
for "Iranian on road vehicles Make and Model Recognition System". 2015

RESEARCH EXPERIENCE

- **University of Waterloo** Waterloo, Canada
Research Collaboration 2020 - present
 - **Stathletes Inc - [2024 - present]**
 - * Ice hockey broadcast video analysis.
 - **Moonrise Medical Inc - [2023 - 2024]**
 - * Developing Machine Learning models on Doppler ultrasound data.
 - **Microsoft Office Media Group - [2020 - 2024]**
 - * Machine Learning for visual relation detection.
 - * Semi-supervised video object segmentation.
 - **Nutrition and Dietary Research Group - [2021 - present]**
 - * A University of Waterloo multidisciplinary research project.
 - * AI modeling of dietary intakes in the presence of measurement error.
 - * AI for estimating usual intake distributions of multiple dietary components.
- **Waterloo Artificial Intelligence Institute (Waterloo.ai)** Waterloo, Canada
Research Assistance 2019 - 2020
 - Collaboration with ETRI of South Korea.
 - * Mitigating catastrophic forgetting on CNN models.
- **INRIA STARS Team** Sophia Antipolis, France
Research Intern 2017 - 2018
 - Recognizing human actions using RGB videos.
- **IPM - Institute for Research in Fundamental Sciences** Tehran, Iran
Research Assistance 2013 - 2014
- **CVPR Lab – Shiraz University** Shiraz, Iran
Research Assistance 2011 - 2017

MENTORSHIP

- **University of Waterloo** Waterloo, Canada
Graduate Research Assistants *2024 - present*
 - Co-mentoring 2 PhD and 6 master students in the sport analytics group.
 - * Utilizing Kanban methods such as Jira for the academic project management.
- **University of Waterloo** Waterloo, Canada
Graduate Research Assistants *2023 - 2024*
 - Sepehr Ghavam - [Winter 2024]
 - * Video object segmentation for long videos.
 - Simon Frew - [Winter 2023]
 - * Neural networks on dietary data with measurement error.
- **University of Waterloo** Waterloo, Canada
Undergraduate Research Assistants *2020 - 2024*
 - Stephie Liu - [Spring 2025]
 - * Rink agnostic homography estimation for Ice Hockey.
 - Jonathan Dumanski - [Winter 2025]
 - * Rink agnostic homography estimation for Ice Hockey.
 - Soyeon Jang - [Winter 2024]
 - * Doppler Ultrasound image classification.
 - Michael Frew - [Fall 2023]
 - * Doppler Ultrasound data analysis.
 - Xin Xue - [Fall 2023]
 - * Continual learning on custom diffusion model.
 - Zeyad Moustafa - [Spring 2023]
 - * Designing a long video object segmentation dataset for continual learning.
 - David Eric Austin - [Winter 2022]
 - * Neural networks on dietary data.
 - Anita Hu - [Spring 2020]
 - * Continual learning for classification tasks.
- **University of Waterloo** Waterloo, Canada
Undergraduate Capstone Project *2025 - present*
 - Supervising a team of 6 undergrad students.
 - * An LLM based coach assistant questioning and answering system via the RAG architectural approach.

PROFESSIONAL EXPERIENCE

- **Shiraz University — Industrial Projects** Shiraz, Iran
Management and Development *2012 - 2017*
 - **Vision-Based Vehicle Speed Estimation (Using a single camera) - [2015 - 2017]**
 - * Role: **Project manager.**
 - * Spearheaded a major initiative for Shiraz University in collaboration with Shiraz municipality.
 - * Led the development of 10 cutting-edge hardware and software vision-based speed estimation systems.
 - **Iranian on-road vehicles Make and Model Recognition (MMR) System - [2012 - 2014]**
 - * Role: **Main contributor**
 - * A Shiraz University project for vehicle MMR of 50 vehicle models .
 - **License Plate Recognition (LPR) and Optical Character Recognition (OCR) - [2012 - 2013]**
 - * Role: **Developer**
 - * Working on fast feature learning methods.
- **Fars Science and Technology Park (FSTP)** Shiraz, Iran
Co-founder *2013 - 2015*
 - Pars Tadbir Intelligent Processing Co.
 - * Virtual showroom platform powered by AI and augmented reality (AR) technology.

- Buzko K., **Nazemi A.**, Clausi DA., Chen Y. Position Paper: Ice Hockey Action Recognition via Contextual Priors. In Linköping Hockey Analytics Conference. 2025. (**Best Paper Award**)
- Iaboni E., Negulescu S., Pitassi M., **Nazemi A.**, Bright J., Chomko V., Clausi DA., Dickinson S., Brecht T. Position Paper: New Views of Shots-Towards Measures of Net Visibility and Reachability. In Linköping Hockey Analytics Conference. 2025.
- Salass L., Bright J., Fieguth P. **Nazemi A.**, Chen Y., Zelek J., Clausi D. In Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition. 2025.
- Spicker D., **Nazemi A.**, Hutchinson J., Fieguth P., Kirkpatrick S.I., Wallace M., Dodd K.W. Challenges for Predictive Modeling With Neural Network Techniques Using Error-Prone Dietary Intake Data. Statistics in Medicine, 2025.
- **Nazemi, A.**, Sepanj, M.H., Pellegrino, N., Czarnecki, C. and Fieguth, P. Particle-Filtering-based Latent Diffusion for Inverse Problems. arXiv preprint, 2024.
- **Nazemi, A.**, Shafiee, M.J., Gharaee, Z. and Fieguth, P. Memory-Efficient Continual Learning Object Segmentation for Long Videos. IEEE Access. 2024
- Sepanj, M. H., **Nazemi, A.**, Preston, C., Lee, A. M. and Fieguth, P. From Single Shot to Structure: End-to-End Network-Based Deflectometry for Specular Free-Form Surface Reconstruction. Applied Sciences, 2024.
- **Nazemi, A.** Continual learning-based Video Object Segmentation.[Doctoral dissertation, University of Waterloo], UWSpace, 2023. <http://hdl.handle.net/10012/19583>
- **Nazemi, A.**, Moustafa, Z., Fieguth, P. Clvos23: A long video object segmentation dataset for continual learning. In Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition. 2023.
- Shafiee, M. J., Jeddi, A., **Nazemi, A.**, Fieguth, P., Wong, A. "Deep Neural Network Perception Models and Robust Autonomous Driving Systems: Practical Solutions for Mitigation and Improvement." IEEE Signal Processing Magazine 38.1 (2020): 22-30.
- **Nazemi, A.**, Fieguth, P. "Identifying threatening samples for adversarial robustness," Safety and Robustness in Decision Making — NeurIPS 2019 workshop, Vancouver, 2019.
- **Nazemi, A.**, Fieguth, P. "Potential adversarial samples for white-box attacks," ML with guarantees NeurIPS 2019 workshop, Vancouver, 2019
- **Nazemi, A.**, Azimifar, Z., Shafiee, M.J., Wong, A. Real-Time Vehicle Make and Model Recognition Using Unsupervised Feature Learning. IEEE Transactions on Intelligent Transportation Systems. 2019.
- **Nazemi, A.**, Kamyab, S., Azimifar, Z., Fieguth, P. Human Perception-based Image Enhancement Using a Deep Generative Model. Journal of Computational Vision and Imaging Systems. 2018 Dec 24;4(1):3-.
- **Nazemi, A.**, Azimifar, Z. "Locality hash-table constrain linear coding for fast image classification." Computer Society of Iran Computer Conference (CSICC), 2015, Iran (In Persian).
- **Nazemi et. al.** "The Impact of Microsoft Kinect on Business Model Innovation." 18th Annual Asian Science Park Association (ASPA) international conference, 2014, Shiraz-Iran.
- **Nazemi, A.**, Azimifar, Z. "Assessment of Photo Aesthetics via Sparse Coding." International Conference of Cognitive Science (ICCS), 2013 5th 7-9 May 2013, Tehran – Iran.

- **Nazemi, A.**, Shafiee, M.J., and Azimifar, Z. "On road vehicle make and model recognition via sparse feature coding." Machine Vision and Image Processing (MVIP), 2013 8th Iranian Conference on. IEEE, 2013.

REFERENCES

- References available upon request.