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 Excelence (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. Ie 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 Collabration — *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.

Publications

- 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.