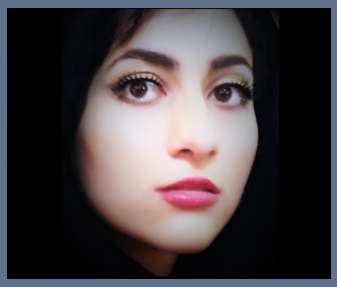
Sarah Rastegar



Profile

Ph.D. student in computer science, passionate about autonomously managing uncertainty and unknowns.

Research Experience

- Open-World Recognition
- Self-Supervised Learning
- Foundation Models
- Causal Inference
- Model Efficiency
- Multimodal Data

Technical Skills

- Python, MATLAB, C/C++
- Pytorch, Tensorflow, OpenCV
- Git, Linux, SLURM
- Blender (Python API)

Soft Skills

- Out-of-the-Box Thinking
- Problem Solving
- Perseverance
- Curiosity & Creativity
- Independence
- Critical Thinking

Contact details

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sarah-rastegar
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Languages

English (fluent), **Persian** (native), **Arabic** (basic)

Education

Ph.D. in Computer Science - Artificial Intelligence

Universiteit van Amsterdam **Nov 2020–present**

◇ Supervisor: *Prof. Cees G. M. Snoek.*
◇ Keywords: Generalized Category Discovery, Video Domain Generalization, Open-World Recognition, Self-Supervised Learning, Causal Inference

Research and Teaching Assistant

Sharif University of Technology **Sep 2015–Sep 2019**

◇ Teaching Assistant for graduate courses including Machine Learning, Deep Learning, Stochastic Processes, Neural Networks and Fuzzy Sets, and Digital Image Processing, as well as the undergraduate course Linear Algebra
◇ Research Assistant specializing in Multimodal Data, Quantized Optimization, Model Efficiency, Anomaly Detection, and 3D spatial Data

M.Sc. in Computer Engineering - Artificial Intelligence

Sharif University of Technology **Sep 2013–Sep 2015**

◇ GPA: 3.9/4
◇ 3rd rank among all M.Sc. students in Artificial Intelligence
◇ Thesis title: *Deep Learning for Multimodal Data*
◇ Result: 20/20 (highest grade possible)
◇ Supervisor: *Prof. Mahdieh Soleymani Baghshah*
◇ Keywords: Multimodal Deep Learning, Image/Text Retrieval, Autoencoders

B.Sc. in Computer Engineering - Hardware

Sharif University of Technology **Sep 2008–Sep 2013**

◇ B.Sc. dissertation: *Intelligent Vehicle Communication System*
◇ Supervisor: *Prof. Afshin Hemmatyar*
◇ Keywords: Vehicle Communication, Artificial Intelligence, Sensor Processing

Honers and Awards

◇ Recipient of INSF grant by *Iranian Foundation of Cash Support for Researchers* for fulfilling research in deep learning **2019**
◇ Selected as a National Scientific Elite and the recipient of the grant for graduate studies from the *Iranian National Elites Foundation*, for outstanding academic success **2016**
◇ 1st Rank among 1015 contestants in the Ph.D. entrance exam in *Computer Engineering - Artificial Intelligence* **2015**
◇ 1st Rank in *Artificial Intelligence* among 32,276 contestants in the M.Sc. entrance exam in *Computer Engineering* **2013**
◇ 2nd Rank in *Computer Networks* among 28,293 contestants in the M.Sc. entrance exam in *Information Technology* **2013**
◇ 2nd Rank in *Information Security* among 28,293 contestants in the M.Sc. entrance exam in *Information Technology* **2013**
◇ 8th Rank in *Computer Architecture* among 32,276 contestants in the M.Sc. entrance exam in *Computer Engineering* **2013**
◇ top 0.1% in *Software Engineering* among 32,276 contestants in the M.Sc. entrance exam in *Computer Engineering* **2013**
◇ top 0.05% among more than 400,000 contestants in the B.Sc. entrance exam in *Mathematics and Physics* **2008**

Organization

◇ Co-organizer, Fifth IPM Advanced School on Computing (ASoC) **Sep 2021**
◇ Organizer and moderator for Video and Image Sense Lab (VisLab) weekly scientific meetings (Soos) **Sep 2021–Jul 2022**

Publication (Full List)

SelFour: Fourier Self-Supervision for Generalized Category Discovery
Sarah Rastegar, Mina Ghadimi Atigh, Pascal Mettes, Yuki M. Asano, Cees G. M. Snoek.
Submitted to CVPR 2025
◇ *Keywords:* Fourier Transforms, Self-Supervised Learning, Open-World Recognition

SelEx: Self-Expertise in Fine-Grained Generalized Category Discovery [link]
Sarah Rastegar, Mohammadreza Salehi, Yuki M. Asano, Hazel Doughty, Cees G. M. Snoek.
European Conference on Computer Vision (ECCV), 2024
◇ *Keywords:* Representation Learning, Self-Supervised Learning, Open-World Recognition
◇ *Summary:* We introduce self-expertise as an alternative to self-supervision, a method that improves model recognition of subtle differences and unknown categories, outperforming existing techniques.

Background No More: Action Recognition Across Domains by Causal Interventions [link]
Sarah Rastegar, Hazel Doughty, Cees G. M. Snoek
Computer Vision and Image Understanding (CVIU), 2024
◇ *Keywords:* Video Domain Generalization, Causal Inference, Fourier Transforms
◇ *Summary:* This paper uses causal interventions to separate action from the background, improving action recognition across different video domains by addressing test-time distribution shifts.

Generalized Category Discovery with Hierarchical Label Smoothing [link]
Sarah Rastegar, Yuki M. Asano, Hazel Doughty, Cees G. M. Snoek.
NeurIPS 2023 Workshop: Self-Supervised Learning - Theory and Practice, 2023
◇ *Keywords:* Representation Learning, Self-Supervised Learning, Open-World Recognition
◇ *Summary:* We introduce label smoothing and a self-supervised cluster hierarchy to enhance contrastive learning, leading to better performance in clustering unknown and known categories.

Learn to Categorize or Categorize to Learn? Self-Coding for Generalized Category Discovery [link]
Sarah Rastegar, Hazel Doughty, Cees G. M. Snoek
Conference on Neural Information Processing Systems (NeurIPS), 2023
◇ *Keywords:* Representation Learning, Model Efficiency, Open-World Recognition
◇ *Summary:* We define "category" as an optimal solution to a well-defined problem. A key feature is using minimum length category codes for data instances, reflecting the implicit category hierarchy.

MDL-CW: A Multimodal Deep Learning Framework with Cross Weights [link]
Sarah Rastegar, Mahdieh Soleymani, Hamid R. Rabiee, Mohsen Shojaei.
Conference on Computer Vision and Pattern Recognition (CVPR), 2016.
◇ *Keywords:* Multimodal Deep Learning, Image/Text Retrieval, Autoencoders
◇ *Summary:* We propose a multimodal deep learning framework (MDL-CW) that learns interactions between modalities from low to high levels using cross weights.

Projects

Using Large Language Models to Discover Novel Category Hierarchies
◇ *Keywords:* Large Language Models, Self-Supervised Learning, Open-World Recognition

Multimodal Diffusion Models for Open World Recognition
◇ *Keywords:* Diffusion Models, Self-Supervised Learning, Open-World Recognition

Quantized Optimization with Gradient Flow through Neural Networks
◇ *Keywords:* Quantization, Model Efficiency, Optimization

Gaussian Process for Anomaly Detection in 3D Spatial Data
◇ *Keywords:* Gaussian Process, Anomaly Detection, 3D Spatial Data