

Saeed Mohseni seh deh

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🔗 LinkedIn | 📄 Google Scholar | 🐙 GitHub

Summary

PhD student in Electrical Engineering with hands-on experience in **machine learning, deep learning, and generative models** (LLMs and diffusion models). Skilled in **PyTorch, Python, and end-to-end model development**, with a solid foundation in **optimization, linear algebra, probability, and statistical inference**. Experienced in **conducting research and publishing scientific work**, seeking opportunities to contribute to **AI/ML projects and applications** in a collaborative, high-impact environment.

Skills

Programming Languages: Python, MATLAB, C.

AI / ML Frameworks: PyTorch, TensorFlow.

Other Tools: Git, LaTeX, MATLAB Simulink.

Soft Skills: Teamwork, Interdisciplinary collaboration, Quick learner, Problem-solving, Communication, Teaching / Mentoring.

Professional Experience

Graduate Research Assistant | Virginia Tech Dec 2023 – Present

- Developed a novel causal discovery algorithm leveraging our newly introduced induced covariance, achieving 35% higher precision and 41.5% higher recall than existing methods. (**S. Mohseni-Sehdeh et. al.**, *ICLR, 2026*, *under review*) ¹
- Developed a novel diffusion-based method for solving inverse problems by posterior sampling with a piecewise guidance term, implemented in PyTorch with OpenAI's diffusion model and tested on ImageNet, maintaining PSNR/SSIM recovery quality while improving time efficiency by $\geq 23\%$ over the baseline. (**S. Mohseni-Sehdeh et. al.**, *IEEE TNNLS*, *under review*) ²
- Developed a modular digital twin-based control system for signal tracking tasks, achieving 49% lower MSE than classical control methods and 16% lower MSE when using causal learning generated training data versus statistical learning data in low data self training scenarios. (**S. Mohseni-Sehdeh et. al.**, *CISS, 2025*) ³

Graduate Teaching Assistant, Senior Design Project | Virginia Tech Jan 2024 – Dec 2024

- Supervised and evaluated 8 student teams developing industry-oriented engineering projects.
- Provided technical and written feedback to improve project design and reporting quality.
- Collaborated with faculty to organize a university-wide project expo presenting 24 student projects.

Graduate Reseach Assistant | Sharif University of Technology Aug 2021 – Jun 2023

- Conducted research on sparse signal processing and dictionary learning for signal classification.
- Developed a novel dictionary-based classification algorithm using undercomplete dictionaries, achieving $10\times$ faster inference and $100\times$ faster training than competing methods while maintaining or improving accuracy. (**S. Mohseni-Sehdeh et. al.**, *Signal Processing, 2023*) ⁴

Graduate Teaching Assistant, Adaptive Filters | Sharif University of Technology Oct 2021 – Feb 2022

- Provided solutions and guidance for homework assignments submitted by students.
- Conducted Q&A sessions to clarify course concepts and assist with problem-solving.

Graduate Teaching Assistant, Digital Signal Processing | Amirkabir University of Technology Feb 2020 – Feb 2021

- Instructed students in MATLAB programming and guided them through technical challenges.
- Designed and evaluated homework assignments to reinforce course concepts.
- Provided individualized support and answered student questions on MATLAB applications.

Education

Virginia Tech

PhD in Electrical and Computer Engineering

Dec 2023 - Dec 2027

CGPA: 4.0/4.0

Relevant Coursework: Statistical Inference, Data Analytics, Cellular Communications

Sharif University of Technology

MSc in Electrical Engineering

Sep 2020 - Sep 2022

CGPA: 3.7/4.0

Relevant Coursework: Deep Learning, Digital Signal Processing II, Random Processes, Numerical Optimization, Information Theory and Coding, Advanced Communications, Adaptive Filters.

Amirkabir University of Technology

BSc in Electrical Engineering

Sep 2016 - Sep 2020

CGPA: 4.0/4.0

Relevant Coursework: Mobile Communications, Telecommunications Networks, Digital Signal Processing I, Linear Algebra, Computer Programming (C), Numerical Analysis, Linear Control Systems.

Publications

1. S. Mohseni-Sehdeh and W. Saad, "Induced Covariance for Causal Discovery in Linear Sparse Structures," submitted to *the 2026 International Conference on Learning Representations (ICLR)*. [\[arXiv\]](#)
2. S. Mohseni-Sehdeh, W. Saad, K. Sakaguchi, and T. Yu, "Diffusion Models for Solving Inverse Problems via Posterior Sampling with Piecewise Guidance," under review at *the IEEE Transactions on Neural Networks and Learning Systems journal*. [\[arXiv\]](#)
3. S. Mohseni-Sehdeh, W. Saad, K. Sakaguchi, and T. Yu, "Causal Digital Twins for Physical System Control," in *Proc. of 2025 59th Annual Conference on Information Sciences and Systems (CISS)*, pp. 1–6, Mar. 2025. [\[DOI\]](#)
4. S. Mohseni-Sehdeh and M. Babaie-Zadeh, "A fast dictionary-learning-based classification scheme using under-complete dictionaries," *Signal Processing*, vol. 212, p. 109124, Nov. 2023. [\[DOI\]](#)

Selected Projects

1. **TinyStories LLM, Building a Small Language Model from Scratch** | [Github repository](#)
 - Built a **4.8M parameter GPT-style transformer LLM** from scratch in **PyTorch** on the TinyStories dataset.
 - Implemented **multi-head attention**, **positional embeddings**, and **layer normalization** manually.
 - Gained deep understanding of transformer internals and training dynamics.
2. **Joint Object and Depth Detection on NYU Depth Dataset V2**
 - Developed a pipeline for simultaneous object detection and depth estimation from images in the NYU Depth Dataset V2.
 - Applied **YOLO** for object detection and a CNN-based model for per-object depth analysis.
 - Conducted experiments to evaluate accuracy of object localization and depth prediction.
 - Demonstrated integration of computer vision techniques for multi-task learning in high-dimensional image data.

**Additional projects and reports are available [here](#).*

Honors & Certificates

- **Fully Funded Ph.D. Student**, Virginia Tech, USA (Present).
- **Fully Funded M.Sc. in Electrical Engineering**, admitted as an *Exceptional Talent Student* to the top 1 university in Iran.
- **Ranked 2nd** in B.Sc. Electrical Engineering class, Amirkabir University of Technology, Iran.
- **Reinforcement Learning Specialization**, Coursera (University of Alberta, Jun 2022). [\[Link\]](#)
- **Generative Adversarial Networks (GANs) Specialization**, Coursera (DeepLearning.AI, Oct 2021). [\[Link\]](#)
- **Deep Learning Specialization**, Coursera (DeepLearning.AI, Aug 2021). [\[Link\]](#)