

# Sina Alemohammad

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## EDUCATION

- Ph.D., Electrical and Computer Engineering**, Rice University, Houston, TX. *Aug 2019 - May 2025*  
*Advisor: Prof. Richard Baraniuk*
- M.Sc. , Electrical and Computer Engineering**, Rice University, Houston, TX. *Aug 2019 - May 2022*  
*Advisor: Prof. Richard Baraniuk*  
*Thesis title: The Recurrent Neural Tangent Kernel*
- B.Sc. in Electrical Engineering**, Sharif University of Technology, Tehran, Iran. *Sep 2014 - Jun 2019*  
*Major Concentration: Communication, Signal Processing*

## WORK EXPERIENCE

- Postdoctoral Fellow**, University of Texas at Austin, Austin, TX. *Jun 2025 - present*  
*Visual Informatics Group*
- Research Scientist Intern** , Adobe, San Jose, CA. *Jun 2024 - Aug 2024*  
*Content Authenticity Initiative*

## HONORS AND AWARDS

- Ken Kennedy Institute bp Graduate Fellowship** *Nov 2023*

## PUBLICATIONS

- Babaei, H., White, M., **Alemohammad, S.** and Baraniuk, R.G., 2025. *WaLRUS: Wavelets for Long-range Representation Using SSMs*. arXiv preprint arXiv:2505.12161.
- Babaei, H., White, M., **Alemohammad, S.** and Baraniuk, R.G., 2025. *Safari: State-space models for frame-agnostic representation*. arXiv preprint arXiv:2505.08977.
- Alemohammad, S.**, Humayun, A.I., Agarwal, S., Collomosse, J. and Baraniuk, R., 2024. *Self-Improving Diffusion Models with Synthetic Data*. arXiv preprint arXiv:2408.16333.

Media coverage:

- [Montreal AI Ethics - Self-Improving Diffusion Models with Synthetic Data](#)

- LeJeune, D. and **Alemohammad, S.**, 2024, January. An Adaptive Tangent Feature Perspective of Neural Networks. In Conference on Parsimony and Learning (pp. 379-394). PMLR.
- Alemohammad, S.**, Casco-Rodriguez J, Luzi L, Humayun AI, Babaei H, LeJeune D, Siahkoohi A, Baraniuk R. 2024. Self-Consuming Generative Models Go MAD. In *The Twelfth International Conference on Learning Representations*.

Selected media coverage:

- [New Scientist - AIs trained on AI-generated images produce glitches and blurs](#)
- [Futurism - AI Loses Its Mind After Being Trained on AI-Generated Data](#)
- [Yahoo!Finance - AI's 'Mad Cow Disease' Problem Tramples Into Earnings Season](#)
- [The Telegraph - 'Mad' AI Risks Destroying the Information Age](#)
- [New York Times - When A.I.'s Output Is a Threat to A.I. Itself](#)

6. LeJeune, D., Luzi, L., Siahkoohi, A., **Alemohammad, S.**, Saragadam, V., Babaei, H., Liu, N., Wang, Z. and Baraniuk, R.G., 2022. TITAN: Bringing The Deep Image Prior to Implicit Representations. *arXiv preprint arXiv:2211.00219*.
7. Babaei, H., **Alemohammad, S.** and Baraniuk, R.G., 2023. Covariate Balancing Methods for Randomized Controlled Trials Are Not Adversarially Robust. *IEEE Transactions on Neural Networks and Learning Systems*.
8. Barberan, C., **Alemohammad, S.**, Liu, N., Balestrieri, R. and Baraniuk, R., 2022, June. NeuroView-RNN: It's About Time. In *2022 ACM Conference on Fairness, Accountability, and Transparency* (pp. 1683-1697).
9. **Alemohammad, S.**, Babaei, H., Barberan, C.J., Liu, N., Luzi, L., Mason, B. and Baraniuk, R.G., 2022, May. NFT-K: Non-Fungible Tangent Kernels. In *ICASSP 2022-2022 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)* (pp. 3798-3802). IEEE.
10. **Alemohammad, S.**, Balestrieri, R., Wang, Z. and Baraniuk, R., 2020. Enhanced Recurrent Neural Tangent Kernels for Non-Time-Series Data. *arXiv preprint arXiv:2012.04859*.
11. **Alemohammad, S.**, Babaei, H., Balestrieri, R., Cheung, M.Y., Humayun, A.I., LeJeune, D., Liu, N., Luzi, L., Tan, J., Wang, Z. and Baraniuk, R.G., 2020. Wearing a MASK: Compressed Representations of Variable-Length Sequences Using Recurrent Neural Tangent Kernels. *ICASSP 2021-2021 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)* (pp. 2950-2954). IEEE.
12. **Alemohammad, S.**, Wang, Z., Balestrieri, R. and Baraniuk, R., 2020. The Recurrent Neural Tangent Kernel. *The International Conference on Learning Representations (ICLR)*, 2021.
13. **Alemohammad, S.** and Amini, A., 2019, July. One-Bit Compressed Sensing Using Smooth Measure of  $\ell_0$  Norm. In *13th International conference on Sampling Theory and Applications (SampTA)* (pp. 1-4). IEEE.
14. Esmaeili, A., Behdin, K., **Alemohammad, S.** and Marvasti, F., 2018. Recovering quantized data with missing information using bilinear factorization and augmented Lagrangian method. *arXiv preprint arXiv:1810.03222*.

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#### POSTERS AND PRESENTATIONS

**One-Bit Compressed Sensing Using Smooth Measure of  $\ell_0$  Norm**, - Oral Presentation  
*SampTA2019, University of Bordeaux, France.*

**Neural Tangent Kernel for Recurrent Neural Networks**, - Poster Presentation  
*Deepmath 2020, New York, NY (virtual conference).*

**The Recurrent Neural Network**, - Invited Talk  
*Rough Path Interest Group, Oxford University, April 2021.*

**Mismatched Kernels: Regularizing via *In Vivo* Model Changes** - Poster Presentation  
*Deepmath 2022, San Diego, CA.*

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#### COMPUTER SKILLS

**Languages:** Python, Matlab, R, C/C++  
**Deep Learning Frameworks:** Pytorch, Jax

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#### REFERENCES

References available upon request.