Ali Siahkoohi

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Education

Georgia Institute of Technology — Atlanta, GA, USA
Doctor of Philosophy in Computational Science and Engineering — Sep. 2016 – Aug. 2022 (expected)

University of Tehran — Tehran, Iran
Master of Science in Geophysics — Sep. 2013 – Mar. 2016

Sharif University of Technology — Tehran, Iran
Bachelor of Science in Electrical Engineering — Sep. 2008 – Aug. 2013

Research Interests

Machine Learning, Inverse Problems, Uncertainty Quantification, Signal Processing

Programming Skills

Languages: Python, Julia, C, MATLAB, Bash
Machine Learning Libraries: TensorFlow, PyTorch, Flux.jl
Cloud Services Platform: Amazon Web Services (AWS)
Message Passing Standard: MPI
Version Control Systems: Git, SVN
Document Preparation Systems: LaTeX, Markdown

Research Experience

Georgia Institute of Technology
Graduate Research Assistant — Jan. 2018 – Present

The University of British Columbia
Graduate Research Assistant — Sep. 2016 – Dec. 2017

Teaching Experience

Georgia Institute of Technology
Teaching Assistant for Imaging with Data-Driven Models — Spring 2020
Teaching Assistant for Numerical Analysis I — Fall 2018

Sharif University of Technology
Teaching Assistant for Signals and Systems — Spring 2011
Teaching Assistant for Digital Signal Processing — Spring 2011
Teaching Assistant for Linear Algebra — Fall 2010
Laboratory Assistant for Principles of Electrical Engineering — Fall 2009

Publications

[1] Ali Siahkoohi, Gabrio Rizzuti, Mathias Louboutin, et al. "Preconditioned training of normalizing flows for variational inference in inverse problems". In: *3rd Symposium on Advances in Approximate Bayesian Inference*. Jan. 2021. URL: https://openreview.net/pdf?id=P9m1sMaNQ8T.

[2] Ali Siahkoohi, Gabrio Rizzuti, Mathias Louboutin, et al. "Unsupervised data-guided uncertainty analysis in imaging and horizon tracking". In: *3rd Annual Meeting of the SIAM Texas-Louisiana Section*. Oct. 2020.

[3] Ali Siahkoohi, Philipp A. Witte, Mathias Louboutin, et al. "Seismic Imaging with Uncertainty Quantification: Sampling from the Posterior with Generative Networks". In: *SIAM Conference on Imaging Science*. IS20. July 2020.

[4] Ali Siahkoohi, Gabrio Rizzuti, Philipp A. Witte, et al. "Faster Uncertainty Quantification for Inverse Problems with Conditional Normalizing Flows". In: *Tech. rep. TR-CSE-2020-2, Georgia Institute of Technology*. July 2020. URL: https://arxiv.org/pdf/2007.07985.pdf.

[5] Gabrio Rizzuti, Ali Siahkoohi, Philipp A. Witte, et al. "Parameterizing uncertainty by deep invertible networks, an application to reservoir characterization". In: *SEG Technical Program Expanded Abstracts 2020*. Sept. 2020, pp. 1541–1545. DOI: 10.1190/segam2020-3428150.1. URL: https://arxiv.org/pdf/2004.07871.pdf.

[6] Mi Zhang, Ali Siahkoohi, and Felix J. Herrmann. "Transfer learning in large-scale ocean bottom seismic wavefield reconstruction". In: *SEG Technical Program Expanded Abstracts 2020*. Sept. 2020, pp. 1666–1670. DOI: 10.1190/segam2020-3427882.1. URL: https://arxiv.org/pdf/2004.07388.pdf.

[7] Ali Siahkoohi, Gabrio Rizzuti, and Felix J. Herrmann. "Weak deep priors for seismic imaging". In: *SEG Technical Program Expanded Abstracts 2020*. Sept. 2020, pp. 2998–3002. DOI: 10.1190/segam2020-3417568.1. URL: https://arxiv.org/pdf/2004.06835.pdf.

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[9] Ali Siahkoohi, Gabrio Rizzuti, and Felix J. Herrmann. "A deep-learning based Bayesian approach to seismic imaging and uncertainty quantification". In: *82nd EAGE Conference and Exhibition 2020*. Jan. 2020. URL: https://arxiv.org/pdf/2001.04567.pdf.

[10] Felix J. Herrmann, Ali Siahkoohi, and Gabrio Rizzuti. "Learned imaging with constraints and uncertainty quantification". In: *NeurIPS 2019 Deep Inverse Workshop*. Dec. 2019. URL: https://arxiv.org/pdf/1909.06473.pdf.

[11] Ali Siahkoohi, Mathias Louboutin, and Felix J. Herrmann. "Neural network augmented wave-equation simulation". In: *Tech. rep. TR-CSE-2019-1, Georgia Institute of Technology*. Sept. 2019. URL: https://arxiv.org/pdf/1910.00925.pdf.

[12] Ali Siahkoohi, Rajiv Kumar, and Felix J. Herrmann. "Deep-learning based ocean bottom seismic wavefield recovery". In: *SEG Technical Program Expanded Abstracts 2019*. Aug. 2019, pp. 2232–2237. DOI: 10.1190/segam2019-3216632.1.

[13] Ali Siahkoohi, Dirk J. Verschuur, and Felix J. Herrmann. "Surface-related multiple elimination with deep learning". In: *SEG Technical Program Expanded Abstracts 2019*. Aug. 2019, pp. 4629–4634. DOI: 10.1190/segam2019-3216723.1.

[14] Ali Siahkoohi, Mathias Louboutin, and Felix J. Herrmann. "The importance of transfer learning in seismic modeling and imaging". In: *Geophysics* 84.6 (July 2019), A47–A52. DOI: 10.1190/geo2019-0056.1.

[15] Gabrio Rizzuti, Ali Siahkoohi, and Felix J. Herrmann. "Learned iterative solvers for the Helmholtz equation". In: *81st EAGE Conference and Exhibition 2019*. June 2019. DOI: 10.3997/2214-4609.201901542.

[16] Felix J. Herrmann, Ali Siahkoohi, and Mathias Louboutin. "Machine Learning in Seismic Imaging—from Low-fidelity to High-fidelity". In: *SIAM Conference on Computational Science and Engineering*. (SIAM CSE). Mar. 2019.

[17] Ali Siahkoohi, Mathias Louboutin, Rajiv Kumar, et al. "Deep-convolutional neural networks in prestack seismic—two exploratory examples". In: *SEG Technical Program Expanded Abstracts 2018*. Oct. 2018, pp. 2196–2200. DOI: 10.1190/segam2018-2998599.1.

[18] Felix J. Herrmann, Gerard J. Gorman, Jan Hückelheim, et al. "The power of abstraction in Computational Exploration Seismology". In: *Smoky Mountains Computational Sciences and Engineering Conference*. Aug. 2018.

[19] Ali Siahkoohi, Rajiv Kumar, and Felix J. Herrmann. "Seismic Data Reconstruction with Generative Adversarial Networks". In: *80th EAGE Conference and Exhibition 2018*. June 2018. DOI: 10.3997/2214-4609.201801393.

[21] Mohmmad Sadegh Ebrahimi, Mohammad Hossein Daraei, Jamshid Rezaei, et al. "A Novel Utilization of Wireless Sensor Networks as Data Acquisition System in Smart Grids". In: *Materials Science and Information Technology*. Vol. 433. Advanced Materials Research. Trans Tech Publications, Jan. 2012, pp. 6725–6730. DOI: 10.4028/www.scientific.net/AMR.433-440.6725.

[22] Amir Najafi, Ali Siahkoohi, and Mohammad B Shamsollahi. "A content-based digital image watermarking algorithm robust against JPEG compression". In: *2011 IEEE International Symposium on Signal Processing and Information Technology (ISSPIT)*. IEEE. Feb. 2011, pp. 432–437. DOI: 10.1109/ISSPIT.2011.6151601.