Julius Richter | Curriculum Vitae

Research interests

I am a computer scientist specializing in machine learning and multimedia signal processing. My research focuses on generative models and multimodal learning for audio-visual understanding and restoration. During my PhD, I developed novel diffusion-based generative approaches for speech enhancement.

Personal Data

Place and date of birth:	Cologne, Germany - 26th of January, 1991
Address:	25-63 36th St, New York, NY 11103
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Education

2020 - 2025 PhD in Computer Science (Summa cum laude), **University of Hamburg**, Germany
Focus on deep generative models and multi-modal learning with applications to audio-visual speech processing
Thesis: "Generative Speech Enhancement in Multimodal Applications"
Supervisor: Prof. Dr. Timo Gerkmann

2017 - 2019 Master of Science in Electrical Engineering (1.4[1]), **TU Berlin**, Germany
Focus on information technology and machine learning
Thesis: "Style-specific Beat Tracking with Deep Neural Networks"
Supervisors: Prof. Dr. Weinzierl, Prof. Dr. Klaus-Robert Müller

2012 - 2016 Bachelor of Science in Electrical Engineering (1.7[1]), **TU Berlin**, Germany
Focus on theoretical electrical engineering with an emphasis on numerical simulation techniques
Thesis: "Analysis of Non-linear Eigenvalue Problems in Electromagnetic Field Simulations"
Supervisor: Prof. Dr.-Ing. Rolf Schuhmann

Work Experience

April 2025 - Current | Postdoctoral researcher at Meta, New York, USA
Working at Meta Superintelligence Labs (MSL)

February 2020 - December 2024 | Research associate at Universität Hamburg, Germany
Working in the transregio project Crossmodal Learning under Grant TRR 169

September 2019 - January 2020 | Freelance at dida Datenschmiede GmbH, Berlin, Germany
Machine learning scientist freelancer

June 2016 - September 2016 | Internship at Ableton AG, Berlin, Germany
Software development

August 2013 - July 2015 | Student assistant at TU Berlin, Germany
Teaching signal processing basics

International Experience

December 2023 Research exchange, **Tsinghua University**, Beijing, China
In the Computer Science Department led by Prof. Jun Zhu under the supervision of Prof. Xiaolin Hu

[1] In Germany, academic grades range from 1 to 5, with 1 being the highest (excellent) and 5 the lowest (failing).

Selected Publications

- J. Richter, S. Welker, J.-M. Lemercier, B. Lay, T. Gerkmann, *"Speech Enhancement and Dereverberation with Diffusion-Based Generative Models,"* IEEE/ACM Transactions on Audio, Speech, and Language Processing, vol. 31, pp. 2351 - 2364, 2023.
- J. Richter, Y.-C. Wu, S. Krenn, S. Welker, B. Lay, S. Watanabe, A. Richard, T. Gerkmann, *"EARS: An Anechoic Fullband Speech Dataset Benchmarked for Speech Enhancement and Dereverberation,"* ISCA Interspeech, Kos, Greece, Sep. 2024.
- J. Richter, S. Frintrop, T. Gerkmann, *"Audio-Visual Speech Enhancement with Score-Based Generative Models,"* ITG Conference on Speech Communication, Aachen, Germany, Sept. 2023.
- J. Richter, S. Welker, J.-M. Lemercier, B. Lay, T. Peer, T. Gerkmann, *"Causal Diffusion Models for Generalized Speech Enhancement,"* IEEE Open Journal of Signal Processing, vol. 5, pp 780-789, 2024.
- J. Richter, S. Welker, J.-M. Lemercier, B. Lay, T. Peer, T. Gerkmann, *"Speech Signal Improvement Using Causal Generative Diffusion Models,"* IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP), Rhodes, Greece, June 2023.
- J.-M. Lemercier, J. Richter, S. Welker, E. Moliner, V. Välimäki, T. Gerkmann, *"Diffusion Models for Audio Restoration,"* IEEE Signal Processing Magazine, Jan. 2025.

Awards

- Recipient of the *ITG VDE award 2024* for the publication "Speech Enhancement and Dereverberation with Diffusion-Based Generative Models".
- *Outstanding Reviewer Recognition* by the Organizing Committee of the International Conference on Acoustics Speech and Signal Processing (ICASSP) 2023.

Teaching

2020 - 2024	Supervision of 5 Bachelor and 3 Master theses
Winter 2021/2022	Seminar Recent Topics in Audio Signal Processing
Summer 2021	Seminar Digital Audio Effects
Winter 2020/2021	Seminar Recent Topics in Audio Signal Processing
Summer 2020	Seminar Digital Audio Effects

Portfolio

- Personal website (24 publications)
- Google Scholar profile (1065 citations, h-index: 15)
- GitHub repository (666 stars)
- Project website
- Research demo