KEVIN WILKINGHOFF

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I am a postdoctoral researcher at Aalborg University with the Pioneer Centre for AI. My work focuses on anomaly and out-of-distribution detection, representation learning, and domain generalization for audio signals. My long-term research vision is to develop robust, domain-generalizable anomaly detection systems that can operate with minimal supervision across diverse audio and multimodal environments.

RESEARCH INTERESTS

Anomaly and out-of-distribution detection

Representation learning for audio and multimodal signals

Domain generalization and robustness

EDUCATION

Ph.D. (Dr.rer.nat.) in Computer Science (summa cum laude) — 10/2022–09/2024
University of Bonn — Bonn, Germany
Thesis: *Audio Embeddings for Semi-Supervised Anomalous Sound Detection*

M.Sc. in Computer Science (with distinction) — 10/2014–05/2017
University of Bonn — Bonn, Germany
Thesis: *Neural Networks in Speaker Identification*

B.Sc. in Mathematics — 10/2010–02/2014
University of Münster — Münster, Germany
Thesis: *Homogenisierung nichtlinearer elliptischer Differentialgleichungen*

PROFESSIONAL EXPERIENCE

Postdoctoral Researcher (with Zheng-Hua Tan) — 02/2025–present
Aalborg University with Pioneer Centre for AI — Aalborg, Denmark

Visiting Research Scientist (with Jonathan Le Roux) — 07/2024–01/2025
Mitsubishi Electric Research Laboratories — Cambridge, MA, USA

Research Associate (with Frank Kurth) — 06/2017–07/2024
Fraunhofer FKIE — Wachtberg, Germany

Student Assistant (multiple positions) — 10/2012–06/2017
University of Münster, University of Bonn, German Aerospace Center and Fraunhofer FKIE — NRW, Germany

GRANTS AND FUNDING

Compute Grant for the *LUMI Supercomputer*, Grant Holder, DeiC (12,000 GPUh) — 2026

Conference Grant for the *1st MMAD Workshop*, Grant Holder, Carlsberg Foundation (78,600 DKK) — 2026

P1 Program on *Multimodal Anomaly Detection*, Program Director, Pioneer Centre for AI (50,000 DKK) — 2025–2027

AWARDS

DCASE 2021 Best Paper Award (as single author) — 2021

DCASE 2021 Challenge Judges' Award - Task 2 (rank 3/27) — 2021

Kölner VDI Förderpreis 2018 (third prize, 500 €) — 2019

AFCEA Bonn Studienpreis 2018 (first prize, 6,000 €) — 2018

PROFESSIONAL RECOGNITION

EURASIP Academy Member — 2026–present

ICASSP 2023 Outstanding Reviewer Recognition (top 4%) — 2023

PUBLICATIONS

PREPRINTS

[1] **K. Wilkinghoff** and Z.-H. Tan. “DSpAST: Disentangled Representations for Spatial Audio Reasoning with Large Language Models”. arXiv:2509.13927, Accepted for presentation at ICASSP. 2026.

[2] **K. Wilkinghoff**, A. Cornaggia-Urrigshardt, and Z.-H. Tan. “Quantization-Based Score Calibration for Few-Shot Keyword Spotting with Dynamic Time Warping in Noisy Environments”. arXiv:2510.15432, Accepted for presentation at ICASSP. 2026.

PEER-REVIEWED JOURNAL ARTICLES

[1] **K. Wilkinghoff**, H. Yang, J. Ebbers, F. G. Germain, G. Wichern, and J. Le Roux. “Local Density-Based Anomaly Score Normalization for Domain Generalization”. In: *IEEE Trans. Audio, Speech, Lang. Process.* 33 (2025).

[2] **K. Wilkinghoff** and F. Kurth. “Why do Angular Margin Losses work well for Semi-Supervised Anomalous Sound Detection?” In: *IEEE/ACM Trans. Audio, Speech, Lang. Process.* 32 (2024).

PEER-REVIEWED CONFERENCE AND WORKSHOP PAPERS

[1] **K. Wilkinghoff**, T. Fujimura, K. Imoto, J. Le Roux, Z.-H. Tan, and T. Toda. “Handling Domain Shifts for Anomalous Sound Detection: A Review of DCASE-Related Work”. In: *Proc. DCASE*. 2025.

[2] T. Fujimura, **K. Wilkinghoff**, K. Imoto, and T. Toda. “ASDKit: A Toolkit for Comprehensive Evaluation of Anomalous Sound Detection Methods”. In: *Proc. DCASE*. 2025.

[3] F. Gökgöz, A. Cornaggia-Urrigshardt, and **K. Wilkinghoff**. “Personalized Speech Synthesis for Zero-Shot Keyword Spotting”. In: *Proc. ITG Speech*. 2025.

[4] **K. Wilkinghoff**, H. Yang, J. Ebbers, F. G. Germain, G. Wichern, and J. Le Roux. “Keeping the Balance: Anomaly Score Calculation for Domain Generalization”. In: *Proc. ICASSP*. 2025.

[5] J. Ebbers, F. G. Germain, **K. Wilkinghoff**, G. Wichern, and J. Le Roux. “No Class Left Behind: A Closer Look at Class Balancing for Audio Tagging”. In: *Proc. ICASSP*. 2025.

[6] **K. Wilkinghoff**. “AdaProj: Adaptively Scaled Angular Margin Subspace Projections for Anomalous Sound Detection with Auxiliary Classification Tasks”. In: *Proc. DCASE*. 2024.

[7] **K. Wilkinghoff** and A. Cornaggia-Urrigshardt. “Multi-Sample Dynamic Time Warping for Few-Shot Keyword Spotting”. In: *Proc. EUSIPCO*. 2024.

[8] F. Fritz, A. Cornaggia-Urrigshardt, L. Henneke, F. Kurth, and **K. Wilkinghoff**. “Analyzing the Impact of HF-Specific Signal Degradation on Automatic Speech Recognition”. In: *Proc. ICMCIS*. 2024.

[9] F. Gökgöz, A. Cornaggia-Urrigshardt, and **K. Wilkinghoff**. “Strong Label Generation for Preparing Speech Data in Military Applications Using CTC Loss”. In: *Proc. ICMCIS*. 2024.

[10] **K. Wilkinghoff**. “Self-Supervised Learning for Anomalous Sound Detection”. In: *Proc. ICASSP*. 2024.

[11] **K. Wilkinghoff** and K. Imoto. “F1-EV Score: Measuring the Likelihood of Estimating a Good Decision Threshold for Semi-Supervised Anomaly Detection”. In: *Proc. ICASSP*. 2024.

[12] **K. Wilkinghoff** and A. Cornaggia-Urrigshardt. “TACos: Learning Temporally Structured Embeddings for Few-Shot Keyword Spotting with Dynamic Time Warping”. In: *Proc. ICASSP*. 2024.

[13] A. Cornaggia-Urrigshardt, F. Fritz, L. Henneke, F. Kurth, C. Schlich, and **K. Wilkinghoff**. “Language Recognition for SSB modulated HF Radio Signals of Short Duration”. In: *Proc. ITG Speech*. 2023.

[14] P. M. Baggenstoss and **K. Wilkinghoff**. “Novel Generative Classifier for Acoustic Events”. In: *Proc. EUSIPCO*. 2023.

[15] **K. Wilkinghoff** and F. Fritz. “On Using Pre-Trained Embeddings for Detecting Anomalous Sounds with Limited Training Data”. In: *Proc. EUSIPCO*. 2023.

[16] **K. Wilkinghoff**. “Design Choices for Learning Embeddings from Auxiliary Tasks for Domain Generalization in Anomalous Sound Detection”. In: *Proc. ICASSP*. 2023.

[17] J. D. Rockbach, L.-F. Bluhm, I. Schlangen, L. Over, S. Apfeld, L. Henneke, and **K. Wilkinghoff**. “Towards Human-Machine Integration for Signal Intelligence Applications”. In: *Proc. SDF*. 2022.

[18] A. Cornaggia-Urrigshardt, N. Jarocky, F. Kurth, S. Urrigshardt, and **K. Wilkinghoff**. “SCALA-Speech: An Interactive System for Finding and Analyzing Speech Content in Audio Data”. In: *Proc. GI-Jahrestagung*. 2022.

[19] A. Cornaggia-Urrigshardt, F. Gökgöz, F. Kurth, H.-C. Schmitz, and **K. Wilkinghoff**. “Speech Recognition Lab”. In: *Proc. ICMCIS*. 2022.

[20] **K. Wilkinghoff**. "Combining Multiple Distributions based on Sub-Cluster AdaCos for Anomalous Sound Detection under Domain Shifted Conditions". In: *Proc. DCASE*. **Best Paper Award**. 2021.

[21] **K. Wilkinghoff**, A. Cornaggia-Urrigshardt, and F. Gökgöz. "Two-Dimensional Embeddings for Low-Resource Keyword Spotting Based on Dynamic Time Warping". In: *Proc. ITG Speech*. 2021.

[22] **K. Wilkinghoff**. "Sub-Cluster AdaCos: Learning Representations for Anomalous Sound Detection". In: *Proc. IJCNN*. 2021.

[23] **K. Wilkinghoff**. "Using Look, Listen, and Learn Embeddings for Detecting Anomalous Sounds in Machine Condition Monitoring". In: *Proc. DCASE*. 2020.

[24] **K. Wilkinghoff**. "On Open-Set Classification with L3-Net Embeddings for Machine Listening Applications". In: *Proc. EUSIPCO*. 2020.

[25] **K. Wilkinghoff**. "On Open-Set Speaker Identification with I-Vectors". In: *Proc. Odyssey*. 2020.

[26] H.-C. Schmitz, F. Kurth, **K. Wilkinghoff**, U. Müllerschkowski, C. Karrasch, and V. Schmid. "Towards Robust Speech Interfaces for the ISS". In: *Proc. IUI Companion*. 2020.

[27] H.-C. Schmitz, A. Cornaggia-Urrigshardt, F. Gökgöz, S. Kent, and **K. Wilkinghoff**. "Calm Interfaces for Integrated C2 Systems". In: *Proc. ICCRTS*. 2019.

[28] **K. Wilkinghoff** and F. Kurth. "Open-Set Acoustic Scene Classification with Deep Convolutional Autoencoders". In: *Proc. DCASE*. 2019.

[29] **K. Wilkinghoff**. "General-Purpose Audio Tagging by Ensembling Convolutional Neural Networks based on Multiple Features". In: *Proc. DCASE*. 2018.

[30] **K. Wilkinghoff**. "Accurately Capturing Speech Feature Distributions by Extending Supervectors for Robust Speaker Recognition". In: *Proc. ITG Speech*. 2018.

[31] **K. Wilkinghoff**, P. M. Baggenstoss, A. Cornaggia-Urrigshardt, and F. Kurth. "Robust Speaker Identification by Fusing Classification Scores with a Neural Network". In: *Proc. ITG Speech*. 2018.

[32] F. Kurth and **K. Wilkinghoff**. "Robust Detection of Jittered Multiply Repeating Audio Events using Iterated Time-Warped ACF". In: *Proc. ICASSP*. 2018.

[33] P. M. Baggenstoss, **K. Wilkinghoff**, and F. Kurth. "Glottal Mixture Model (GLOMM) for Speaker Identification on Telephone Channels". In: *Proc. EUSIPCO*. 2017.

INVITED CONFERENCE PAPERS (PEER-REVIEWED ABSTRACT)

[1] **K. Wilkinghoff**, T. Fujimura, K. Imoto, and J. Le Roux. "Handling Domain Shifts for Anomalous Sound Detection: A Review". In: *Proc. DAS/DAGA*. 2025.

[2] **K. Wilkinghoff** and A. Cornaggia-Urrigshardt. "On Choosing Decision Thresholds for Anomalous Sound Detection in Machine Condition Monitoring". In: *Proc. ICA*. 2022.

TECHNICAL REPORTS FOR RESEARCH CHALLENGES

Authored 9 technical reports for DCASE challenge tasks and the MCE speaker recognition challenge (2018-2024).

TEACHING EXPERIENCE

Teaching Assistant 04/2019–09/2023
University of Bonn Bonn, Germany
Supervised 3 lab projects and 2 seminar talks; delivered 3 substitute lectures.

Student Assistant: Tutor 10/2012–09/2016
University of Bonn, University of Münster NRW, Germany
Taught weekly exercise classes for 12 courses; graded assignments and exams.

THESIS SUPERVISION

[1] C. T. Kjeldsen. "Automated Demand Planning Using Statistical and AI Methods at Nordex-Food". In progress. Master's Thesis. Aalborg University.

[2] R. Drongesen. "Self-Supervised Spectrogram Reconstruction using MAE-ViT for Anomaly Detection in Pump Audio Signals". Master's Thesis. Aalborg University, June 2025.

[3] R. Maadanli. "Active Learning for Few-Shot Keyword Spotting". Master's Thesis. University of Bonn, Sept. 2024.

[4] J. Schmidt. “Acoustic Flow Rate Estimation of Water in Urban Sewage Systems”. Master’s Thesis. University of Bonn, Mar. 2024.

[5] F. Fritz. “Classifying Sounds into Broad Categories as Pre-Processing for Social Media Analysis”. Master’s Thesis. University of Bonn, Nov. 2022.

INVITED TALKS

[1] *Representation Learning for Anomalous Sound Detection*. Doshisha University, Kyoto, Japan. Oct. 2024.

COMMUNITY SERVICE

WORKSHOP ORGANIZATION

Organizer, 1st Workshop on Multimodal Anomaly Detection (2026)

Industry Liaison Chair (Europe), DCASE 2024

Website and Social Media Chair, DCASE 2022

AREA CHAIR ROLES

IJCNN (2025-2026)

CONFERENCE REVIEWING

ICASSP, Interspeech, EUSIPCO, IJCNN, WASPAA, ASRU, DCASE, ITG Speech, and others.

JOURNAL REVIEWING

TASLP, TPAMI, SPL, JASP, Pattern Recognition, and others.

OTHER PROFESSIONAL ROLES

Technical Support for DCASE Community (2023–present)