

KEVIN WILKINGHOFF

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EDUCATION

- 10/2022 Ph.D. (Dr.rer.nat.) in Computer Science
-present Rheinische Friedrich-Wilhelms-Universität, Bonn
Thesis: *Audio Embeddings for Semi-Supervised Anomalous Sound Detection*
Supervisors: Frank Kurth, Reinhard Klein
- 10/2014 M.Sc. in Computer Science (with distinction)
-5/2017 Rheinische Friedrich-Wilhelms-Universität, Bonn
Thesis: *Neural Networks in Speaker Identification*
Supervisors: Frank Kurth, Andreas Weber
- 10/2010 B.Sc. in Mathematics
-2/2014 Westfälische Wilhelms-Universität, Münster
Minor subject: Computer Science
Thesis: *Homogenisierung nichtlinearer elliptischer Differentialgleichungen*
Supervisors: Mario Ohlberger, Caterina Ida Zeppieri
- 8/2000 Abitur
-6/2009 Freiherr-vom-Stein-Gymnasium, Hamm

INTERESTS

Machine Listening
Anomaly Detection
Open-Set Classification

RESEARCH AND PROFESSIONAL EXPERIENCE

- 6/2017 Research Associate
-present Fraunhofer Institute for Communication, Information Processing and Ergonomics FKIE, Wachtberg
Working on Acoustic Scene/Event Classification, Anomalous Sound Detection, Keyword Spotting, Speaker Recognition and Language Recognition
- 10/2016 Student Assistant
-6/2017 Fraunhofer Institute for Communication, Information Processing and Ergonomics FKIE, Wachtberg
Evaluating various techniques for recognizing speakers for my Master's thesis
- 1/2014 Student Assistant
-12/2014 Institute of Materials Research, Deutsches Zentrum für Luft- und Raumfahrt, Köln
Writing scripts for automatically evaluating measurement data
- 11/2013 Student Assistant
-3/2014 Institute for Numerical Simulation, Rheinische Friedrich-Wilhelms-Universität, Bonn
Refactoring of a software package for k-nearest neighbor search
- 8/2009 Civilian Service
-4/2010 St. Marien-Hospital, Hamm

AWARDS

- 11/2021 DCASE 2021 Best Paper Award
for *Combining Multiple Distributions based on Sub-Cluster AdaCos for Anomalous Sound Detection under Domain Shifted Conditions*
- 11/2021 DCASE 2021 Challenge Judges' Award
for my submission *Utilizing Sub-Cluster AdaCos for Anomalous Sound Detection under Domain Shifted Conditions* ranked 3/27
- 1/2019 Kölner VDI Förderpreis 2018 (third prize)
for my Master's thesis *Neural Networks in Speaker Identification*
- 8/2018 AFCEA Bonn Studienpreis 2018 (first prize)
for my Master's thesis *Neural Networks in Speaker Identification*

TEACHING EXPERIENCE

Teaching Assistant: Advisor

Institute of Computer Science, Rheinische Friedrich-Wilhelms-Universität, Bonn

- Summer 2022: Lab: Audio, assisted in supervising a Master's thesis
- Winter 2021: Seminar: Audio
- Summer 2021: Lab: Audio
- Winter 2020: Seminar: Audio
- Summer 2019: Praktikum: Sensordatenfusion

Student Assistant: Tutor

Mathematical Institute and Institute of Computer Science, Rheinische Friedrich-Wilhelms-Universität, Bonn

- Summer 2016: Artificial Life, Lineare Algebra für Informatiker und Lehramt
- Winter 2015: Analysis 1, Technical Neural Nets
- Summer 2015: Analysis 2, Artificial Life
- Winter 2014: Analysis 1

Student Assistant: Tutor

Mathematical Institute and Institute of Computer Science, Westfälische Wilhelms-Universität, Münster

- Summer 2013: Diskrete Strukturen
- Winter 2012: Analysis 1

PUBLICATIONS

IN PEER-REVIEWED CONFERENCE PROCEEDINGS

- [1] Kevin Wilkinghoff and Alessia Cornaggia-Urrigshardt. "On choosing decision thresholds for anomalous sound detection in machine condition monitoring". In: *24th International Congress on Acoustics (ICA)*. **Invited Paper**. The Acoustical Society of Korea, 2022.
- [2] Jonas D. Rockbach, Luka-Franziska Bluhm, Isabel Schlangen, Laura Over, Sabine Apfeld, Lukas Henneke, and Kevin Wilkinghoff. "Towards Human-Machine Integration for Signal Intelligence Applications". In: *14th Symposium Sensor Data Fusion (SDF)*. IEEE, 2022.
- [3] Alessia Cornaggia-Urrigshardt, Nikita Jarocky, Frank Kurth, Sebastian Urrigshardt, and Kevin Wilkinghoff. "SCALA-Speech: An Interactive System for Finding and Analyzing Speech Content in Audio Data". In: *52. Jahrestagung der Gesellschaft für Informatik (GI-Jahrestagung)*. Vol. P-326. LNI, GI, 2022, pp. 81–90.
- [4] Alessia Cornaggia-Urrigshardt, Fahrettin Gökgöz, Frank Kurth, Hans-Christian Schmitz, and Kevin Wilkinghoff. "Speech Recognition Lab". In: *International Conference on Military Communications and Information Systems (ICM-CIS)*. Vol. 205. Procedia Computer Science. Elsevier, 2022, pp. 218–228.
- [5] Kevin Wilkinghoff. "Combining Multiple Distributions based on Sub-Cluster AdaCos for Anomalous Sound Detection under Domain Shifted Conditions". In: *Detection and Classification of Acoustic Scenes and Events Workshop (DCASE)*. **Best Paper Award**. 2021, pp. 55–59.
- [6] Kevin Wilkinghoff, Alessia Cornaggia-Urrigshardt, and Fahrettin Gökgöz. "Two-Dimensional Embeddings for Low-Resource Keyword Spotting Based on Dynamic Time Warping". In: *14th ITG Conference on Speech Communication (ITG Speech)*. VDE-Verlag, 2021, pp. 9–13.
- [7] Kevin Wilkinghoff. "Sub-Cluster AdaCos: Learning Representations for Anomalous Sound Detection". In: *International Joint Conference on Neural Networks (IJCNN)*. IEEE, 2021.
- [8] Kevin Wilkinghoff. "Using Look, Listen, and Learn Embeddings for Detecting Anomalous Sounds in Machine Condition Monitoring". In: *Detection and Classification of Acoustic Scenes and Events Workshop (DCASE)*. 2020, pp. 215–219.

- [9] Kevin Wilkinghoff. “On Open-Set Classification with L3-Net Embeddings for Machine Listening Applications”. In: *28th European Signal Processing Conference (EUSIPCO)*. IEEE, 2020, pp. 800–804.
- [10] Kevin Wilkinghoff. “On Open-Set Speaker Identification with I-Vectors”. In: *Odyssey - The Speaker and Language Recognition Workshop (Odyssey)*. ISCA, 2020, pp. 408–414.
- [11] Hans-Christian Schmitz, Frank Kurth, Kevin Wilkinghoff, Uwe Müllerschowski, Christian Karrasch, and Volker Schmid. “Towards Robust Speech Interfaces for the ISS”. In: *International Conference on Intelligent User Interfaces (IUI) Companion*. ACM, 2020, pp. 110–111.
- [12] Hans-Christian Schmitz, Alessia Cornaggia-Urrigshardt, Fahrettin Gökgöz, Samantha Kent, and Kevin Wilkinghoff. “Calm Interfaces for Integrated C2 Systems”. In: *International Command and Control Research and Technology Symposium (ICCRTS)*. 2019.
- [13] Kevin Wilkinghoff and Frank Kurth. “Open-Set Acoustic Scene Classification with Deep Convolutional Autoencoders”. In: *Detection and Classification of Acoustic Scenes and Events Workshop (DCASE)*. New York University, 2019, pp. 258–262.
- [14] Kevin Wilkinghoff. “General-Purpose Audio Tagging by Ensembling Convolutional Neural Networks based on Multiple Features”. In: *Detection and Classification of Acoustic Scenes and Events Workshop (DCASE)*. Tampere University of Technology, 2018, pp. 44–48.
- [15] Kevin Wilkinghoff. “Accurately Capturing Speech Feature Distributions by Extending Supervectors for Robust Speaker Recognition”. In: *13th ITG Symposium on Speech Communication (ITG Speech)*. VDE-Verlag, 2018, pp. 81–85.
- [16] Kevin Wilkinghoff, Paul M. Baggenstoss, Alessia Cornaggia-Urrigshardt, and Frank Kurth. “Robust Speaker Identification by Fusing Classification Scores with a Neural Network”. In: *13th ITG Symposium on Speech Communication (ITG Speech)*. VDE-Verlag, 2018, pp. 261–265.
- [17] Frank Kurth and Kevin Wilkinghoff. “Robust Detection of Jittered Multiply Repeating Audio Events using Iterated Time-Warped ACF”. In: *International Conference on Acoustics, Speech and Signal Processing (ICASSP)*. IEEE, 2018, pp. 276–280.
- [18] Paul M. Baggenstoss, Kevin Wilkinghoff, and Frank Kurth. “Glottal Mixture Model (GLOMM) for Speaker Identification on Telephone Channels”. In: *25th European Signal Processing Conference (EUSIPCO)*. IEEE, 2017, pp. 2734–2738.

COMMUNITY INVOLVEMENT

CONFERENCE ACTIVITIES

Website and Social Media Chair: DCASE 2022

PEER REVIEW ACTIVITIES

Conferences: DCASE 2021, 2022; ICASSP 2023; ITG Speech 2021

Journals: Elsevier Pattern Recognition Letters, IEEE Access, IEEE Transactions on Audio, Speech and Language Processing, Journal of the Acoustical Society of America

Kevin Wilkinghoff
Niederkassel, October 28, 2022