Martin Strauss

email: martin.strauss1207@gmail.com

Experience

RESEARCH SCIENTIST |SINCE JANUARY 2025 | MIRELO AI

- Research and development on audio compression, codec development for large-scale audio models, with a focus on generative systems for music and sound effects (SFX) synthesis
- Evaluation of generative audio models

RESEARCH INTERN | JUL – SEP 2023 | MICROSOFT APPLIED SCIENCES GROUP | MUNICH, GERMANY

- Project: Real-Time Area-based Sound Source Separation
- Separation of unknown number of speaker utterances in a pre-defined spatial region
- Development of an efficient steering algorithm in inference time
- Outcome: Two publications, one filed patent

RESEARCH ASSISTANT | NOV 2019 - DEC 2024 | AUDIOLABS ERLANGEN, FAU ERLANGEN-NÜRNBERG

- Research topic: Speech enhancement, generative models, normalizing flows, GANs
- Contributions to Dialogue Enhancement for broadcasting
- Contributions to Neural Audio Coding
- Teaching: Audio Processing Seminar, Audio Processing Laboratory

RESEARCH ASSISTANT | AUG - OCT 2019 | PATTERN RECOGNITION LAB, FAU ERLANGEN-NÜRNBERG

- Investigating the usage of Deep Learning techniques for event detection and classification on power grids (e.g. short circuits)
- Supervised by Prof. Elmar Nöth; cooperation with the Siemens AG
- Outcome: One patent

WORKING STUDENT | JUN 2018 - MAY 2019 | FRAUNHOFER IIS, ERLANGEN, GERMANY

- NLP research assistant
- Implementation of evaluation scripts for NLP, Data augmentation, Question answering from text

RESEARCH VISIT | OCT - DEC 2017 | INRIA RENNES - BRETAGNE ATLANTIQUE, RENNES, FRANCE

- Topic: Sound source localization with drones
- Implementation of localization algorithms
- Development of the first annotated dataset (DREGON) in this field

Education

RESEARCH ASSISTANT AND PHD CANDIDATE | SINCE NOV 2019 | AUDIOLABS ERLANGEN, FAU ERLANGEN-NÜRNBERG

- Supervisor: Prof. Dr.-Ing. Bernd Edler
- PhD thesis: Single-Channel Speech Enhancement with Normalising Flows

M.SC. MEDICAL ENGINEERING | JUL 2019 | FAU ERLANGEN-NÜRNBERG

- Medical Image and Data Processing
- Thesis: "Modelling of Speech Aspects in Parkinson's Disease by Multitask Deep Learning"

B.SC. MEDICAL ENGINEERING | JAN 2017 | FAU ERLANGEN-NÜRNBERG

- Thesis: "Comparison of Segmentation and Classification algorithms for gait sequence analysis in hereditary spastic paraplegia patients"

B.SC. SPORTS SCIENCE | SEP 2013 | TU MUNICH

- Thesis: "An investigation of Yips-Symptoms in Golf Novices"
- Nomination: Gertrude-Krombholz Award

Additional Projects

SMA2 WORKSHOP | 2018/2019| MEDELLIN, COLOMBIA AND ERLANGEN, GERMANY

- Joint project of the University of Antioquia and the FAU Erlangen-Nürnberg
- Project: Development of an Android application to monitor disease progression in Parkinson's patients through speech, gait and hands movement
- Exercise implementations, server and backend programming

Selected publications

N. Pia, **M. Strauss**, M. Multrus, B. Edler: FlowMAC: Conditional Flow Matching for Audio Coding at Low Bit Rates", submitted to ICASSP 2025, available at https://arxiv.org/abs/2409.17635

M. Strauss, W. Mack, M. L. Valero, O. Köpüklü: "Inference-Adaptive Neural Steering for Real-Time Area-Based Sound Source Separation", 2025, Signal Processing Letters, available at https://arxiv.org/abs/2408.12982

M. Strauss, O. Köpüklü: " Efficient Area-based and Speaker-Agnostic Source Separation", *IEEE International Workshop on Acoustic Signal Enhancement (IWAENC),* 2024, pp. 185-189

M. Strauss, N. Pia, N. K. S. Rao and B. Edler: "SEFGAN: Harvesting the Power of Normalizing Flows and GANs for Efficient High-Quality Speech Enhancement", *IEEE Workshop on Applications of Signal Processing to Audio and Acoustics (WASPAA),* 2023, pp. 1-5

L. Resti, **M. Strauss**, M. Torcoli, E. Habets and B. Edler: "Predicting Preferred Dialogue-to-Background Loudness Difference in Dialogue-Separated Audio", in *15th International Conference on Quality of Multimedia Experience (QoMEX)*, 2023, pp. 217-220

M. Strauss, M. Torcoli and B. Edler: "Improved Normalizing Flow-Based Speech Enhancement using an All-pole Gammatone Filterbank for Conditional Input Representation", *IEEE Spoken Language Technology Workshop (SLT)*, 2023, pp. 444-450

M. Strauss, J. Paulus, M. Torcoli and B. Edler: "A Hands-On Comparison of DNNs for Dialog Separation Using Transfer Learning from Music Source Separation", *Proc. Interspeech Conf.*, 2021, pp. 3900-3904

M. Strauss and B. Edler: "A Flow-Based Neural Network for Time Domain Speech Enhancement", *IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, 2021, pp. 5754-5758

A. Deleforge, D. Di Carlo, **M. Strauss** et al.: "Audio-Based Search and Rescue With a Drone: Highlights From the IEEE Signal Processing Cup 2019 Student Competition [SP Competitions]", *IEEE Signal Processing Magazine*, vol. 36 (5), pp. 138-144

M. Strauss, P. Mordel, V. Miguet and A. Deleforge: "DREGON: Dataset and Methods for UAV-Embedded Sound Source Localization", *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2018, pp. 1-8

Patents

N. Pia, **M. Strauss**, M. Multrus, B. Edler: "Apparatus and Method for Decoding an Encoded Audio Signal Using a Conditional Flow Matching Based Process". Publication Pending. Filed 2024-09-06. Patent pending.

M. Strauss, O. Köpüklü, M. Luis Valero: "Intelligent Area-based Sound Source Separation". Publication pending. Filed 2024-03-06. Patent pending.

M. Strauss, B. Edler, M. Torcoli: "Apparatuses for providing a processed audio signal, apparatuses for providing neural network parameters, methods and computer program". WO2023186934A1. Filed 2023-03-28. Patent pending.

M. Strauss, B. Edler: "An Apparatus For Providing A Processed Audio Signal, A Method For Providing A Processed Audio Signal, An Apparatus For Providing Neural Network Parameters And A Method For Providing Neural Network Parameters. " EP 4 233 051 B1. Filed 2021-05-06, granted 2024-07-10.

S. Gaube, R. Kirkman, M. Jaworski, P. Klumpp, **M. Strauss**, J. Jäger, E. Nöth: "Safety Device and Method For Monitoring An Electrical Energy Supply Network." EP 4 012 864 B1. Filed 2020-12-09, granted 2023-11-01.

Skills

PROFESSIONAL TOOLS AND SKILLS

Programming languages: Python, Matlab, C++

ML-Ops/Deployment Tools: Docker, AWS, Slurm

Machine Learning Frameworks: PyTorch, Hydra, Tensorflow, Lightning

LANGUAGE SKILLS

German (native)   English (fluent)   Russian (Conversational)   Spanish (Elementary)

Interests

Deep Learning   Machine Learning   Audio and Speech processing   Deep Generative Models
Literature   Guitar   Music   Traveling   Languages