Publications by Zhao Ren

Update time: Feb. 2026

I. Book Chapters

1) N. Cummins, Z. Ren, A. Mallol-Ragolta, and B. W. Schuller, *Artificial Intelligence in Precision Health*, ch. Chapter 5 – Machine learning in digital health, recent trends, and ongoing challenges, pp. 121–148. Elsevier, 2020

II. Guest Editorals

2) Z. Ren, B. W. Schuller, B. M. Eskofier, T. N. Nguyen, and W. Nejdl, "Guest editorial trustworthy and collaborative AI for personalised healthcare through edge-of-things," *IEEE Journal of Biomedical and Health Informatics*, pp. 5213–5215, 2023

III. Journal Articals

3) T. T. Nguyen, Z. Ren, T. Pham, P. Le Nguyen, Q. V. H. Nguyen, and H. Yin, "A review of instruction-guided image editing," *Engineering Applications of Artificial Intelligence*, vol. 163, no. 2, pp. 112953 (1–35), 2026
4) T. T. Nguyen, T. T. Huynh, Z. Ren, P. L. Nguyen, A. W.-C. Liew, H. Yin, and Q. V. H. Nguyen, "A survey of machine unlearning," *ACM Transactions on Intelligent Systems and Technology*, vol. 16, no. 5, pp. 108 (1–46), 2025
5) P. Wißbrock, L. Koschek, Z. Ren, and W. Nejdl, "Enhancing quality inspection of highly variant geared motors," *Applied Acoustics*, vol. 235, no. 110687, pp. 1–17, 2025
6) Y. Sun, Y. Zhou, X. Xu, J. Qi, F. Xu, Z. Ren, and B. W. Schuller, "Weakly-supervised depression detection in speech through self-learning based label correction," *IEEE Transactions on Audio, Speech and Language Processing*, vol. 33, pp. 748–758, 2025
7) Y. Chang, Z. Ren, Z. Zhang, X. Jing, K. Qian, X. Shao, B. Hu, T. Schultz, and B. W. Schuller, "STAA-Net: A sparse and transferable adversarial attack for speech emotion recognition," *IEEE Transactions on Affective Computing*, vol. 16, no. 2, pp. 861–874, 2024
8) T. T. Nguyen, T. T. Huynh, Z. Ren, T. T. Nguyen, P. L. Nguyen, H. Yin, and Q. V. H. Nguyen, "Privacy-preserving explainable AI: A survey," *SCIENCE CHINA Information Sciences*, vol. 68, no. 111101, pp. 1–34, 2025
9) P. Wißbrock, Z. Ren, and D. Pelkmann, "More than spectrograms: Deep representation learning for machinery fault detection," *Applied Acoustics*, vol. 225, no. 110178, pp. 1–14, 2024
10) Z. Ren, Y. Chang, T. T. Nguyen, Y. Tan, K. Qian, and B. W. Schuller, "A comprehensive survey on heart sound analysis in the deep learning era," *IEEE Computational Intelligence Magazine*, vol. 19, no. 3, pp. 42–57, 2024
11) T. N. Tam, Z. Ren, T. T. Nguyen, J. Jo, Q. V. H. Nguyen, and H. Yin, "Portable graph-based rumour detection against multimodal heterophily," *Knowledge-Based Systems*, 2023
12) Z. Ren, Y. Chang, W. Nejdl, and B. W. Schuller, "Learning complementary representations via attention-based ensemble learning for cough-based COVID-19 recognition," *Acta Acustica*, vol. 6, no. 29, pp. 1–5, 2022
13) Z. Ren, Y. Chang, K. D. Bartl-Pokorny, F. B. Pokorny, and B. W. Schuller, "The acoustic dissection of cough: Diving into machine listening-based COVID-19 analysis and detection," *Journal of Voice*, vol. 38, no. 6, pp. 1264–1277, 2022
14) Z. Ren, K. Qian, F. Dong, Z. Dai, W. Nejdl, Y. Yamamoto, and B. W. Schuller, "Deep attention-based neural networks for explainable heart sound classification," *Machine Learning with Applications*, vol. 9, pp. 1–9, 2022
15) Y. Chang, X. Jing, Z. Ren, and B. W. Schuller, "CovNet: A transfer learning framework for automatic COVID-19 detection from crowd-sourced cough sounds," *Frontiers in Digital Health*, vol. 3, no. 799067, pp. 1–11, 2022
16) K. Qian, M. Schmitt, H. Zheng, T. Koike, J. Han, J. Liu, W. Ji, J. Duan, M. Song, Z. Yang, Z. Ren, S. Liu, Z. Zhang, Y. Yamamoto, and B. W. Schuller, "Computer audition for fighting the SARS-CoV-2 corona crisis – Introducing the multitask speech corpus for COVID-19," *IEEE Internet of Things Journal*, vol. 8, no. 21, pp. 16035–16046, 2021
17) B. Sertolli, Z. Ren, B. W. Schuller, and N. Cummins, "Representation transfer learning from deep end-to-end speech recognition networks for the classification of health states from speech," *Computer Speech & Language*, vol. 68, p. 101204, 2021
18) M. Song, A. Mallol-Ragolta, E. Parada-Cabaleiro, Z. Yang, S. Liu, Z. Ren, Z. Zhao, and B. W. Schuller, "Frustration recognition from speech during game interaction using wide residual networks," *Virtual Reality & Intelligent Hardware*, vol. 3, no. 1, pp. 76–86, 2021
19) Z. Ren, Q. Kong, J. Han, M. Plumbley, and B. W. Schuller, "CAA-Net: Conditional atrous CNNs with attention for explainable device-robust acoustic scene classification," *IEEE Transactions on Multimedia*, vol. 23, pp. 4131–4142, 2020
20) K. Qian, F. Dong, Z. Ren, Z. Dai, B. Dong, and B. W. Schuller, "Opportunities and challenges for heart sound recognition: A brief on the Heart Sounds Shenzhen corpus," *Journal of Fudan University (Natural Science)*, vol. 59, no. 3, pp. 354–359, 2020
21) F. Dong, K. Qian, Z. Ren, A. Baird, X. Li, Z. Dai, B. Dong, F. Metze, Y. Yamamoto, and B. W. Schuller, "Machine listening for heart status monitoring: Introducing and benchmarking HSS – the heart sounds shenzhen corpus," *IEEE Journal of Biomedical and Health Informatics*, vol. 24, no. 7, pp. 2082–2092, 2019
22) J. Han, Z. Zhang, Z. Ren, and B. W. Schuller, "Exploring perception uncertainty for emotion recognition in dyadic conversation and music listening," *Cognitive Computation*, vol. 13, pp. 231–240, 2020
23) Z. Zhao, Z. Bao, Y. Zhao, Z. Zhang, N. Cummins, Z. Ren, and B. W. Schuller, "Exploring deep spectrum representations via attention-based recurrent and convolutional neural networks for speech emotion recognition," *IEEE Access*, vol. 7, pp. 97515–97525, 2019
24) J. Han, Z. Zhang, Z. Ren, and B. W. Schuller, "EmoBed: Strengthening monomodal emotion recognition via training with crossmodal emotion embeddings," *IEEE Transactions on Affect Computing*, vol. 12, no. 3, pp. 553–564, 2019
25) Z. Ren, K. Qian, Z. Zhang, V. Pandit, A. Baird, and B. W. Schuller, "Deep scalogram representations for acoustic scene classification," *IEEE/CAA Journal of Automatica Sinica*, vol. 5, no. 3, pp. 662–669, 2018

IV. Conference Papers

26) R. A. Rammohan, Z. Ren, D. Puchała, A. Świderska, D. Küster, and T. Schultz, "Leveraging semi-supervised learning for multimodal hate speech data annotation and detection," in *Proc. LREC*, (Mallorca, Spain), pp. 1–9, 2026
27) R. A. Rammohan, Z. Ren, A. Swiderska, D. Küster, and T. Schultz, "Unveiling deep speech embeddings: Acoustic insights into hatespeech detection," in *ITG*, (Berlin, Germany), pp. 16–20, 2025
28) Y. Chang, Z. Ren, Z. Zhao, T. T. Nguyen, K. Qian, T. Schultz, and B. W. Schuller, "Breaking resource barriers in speech emotion recognition via data distillation," in *Proc. INTERSPEECH*, (Rotterdam, The Netherlands), pp. 141–145, 2025
29) K. Scheck, T. Dombeck, Z. Ren, P. Wu, M. Wand, and T. Schultz, "DiffMV-ETS: Diffusion-based multi-voice

electromyography-to-speech conversion using speaker-independent speech training targets," in *Proc. INTERSPEECH*, (Rotterdam, The Netherlands), pp. 5573–5577, 2025
30) Z. Ren, R. A. Rammohan, K. Scheck, S. Li, and T. Schultz, "End-to-end acoustic-linguistic emotion and intent recognition enhanced by semi-supervised learning," in *Proc. EMBC*, (Copenhagen, Denmark), pp. 1–4, 2025
31) R. E. Paul, P. Kock, L. Deichsel, Z. Ren, Y. Hartmann, and T. Schultz, "Validating automated assessment tests with depth sensors in older adults," in *Proc. EMBC*, (Copenhagen, Denmark), pp. 1–4, 2025
32) R. V. Sharan, Z. Ren, and B. W. Schuller, "Fine-tuning a pre-trained CNN combined with self-attention for speech emotion recognition," in *Proc. EMBC*, (Copenhagen, Denmark), pp. 1–4, 2025
33) C. Tan, S. Li, Y. Cao, Z. Ren, and T. Schultz, "Investigating effective speaker property privacy protection in federated learning for speech emotion recognition," in *Proc. ACM Multimedia Asia*, (Kuala Lumpur, Malaysia), pp. 1–7, 2024
34) Z. Ren, K. Scheck, Q. Hou, S. v. Gogh, M. Wand, and T. Schultz, "Diff-ETS: Learning a diffusion probabilistic model for electromyography-to-speech conversion," in *Proc. EMBC*, (Orlando, FL), pp. 1–4, 2024
35) K. Scheck, Z. Ren, T. Dombeck, J. Sonnert, S. v. Gogh, Q. Hou, M. Wand, and T. Schultz, "Cross-speaker training and adaptation for electromyography-to-speech conversion," in *Proc. EMBC*, (Orlando, FL), pp. 1–4, 2024
36) Q. Hou, S. v. Gogh, K. Scheck, Z. Ren, T. Schultz, M. Wand, and J. Schmidhuber, "emg2vec: Self-supervised pretraining in electromyography-based silent speech interfaces," in *Proc. EMBC*, (Orlando, FL), pp. 1–5, 2024
37) M. Song, Z. Yang, A. Triantafyllopoulos, Y. Nakamura, Toru Zhang, Z. Ren, H. Takeuchi, A. Kishi, T. Ishizawa, K. Yoshiuchi, H. Zhang, K. Qian, B. Hu, B. W. Schuller, and Y. Yamamoto, "Crossmodal transformer on multi-physical signals for personalised daily mental health prediction," in *Proc. ICDMW*, 2023
38) Z. Ren, K. Qian, T. Schultz, and B. W. Schuller, "An overview of the icassp special session on ai security and privacy in speech and audio processing," in *ACM Multimedia Asia workshop*, (Tainan, Taiwan), 2023
39) Z. Ren, K. Scheck, and T. Schultz, "Self-learning and active-learning for electromyography-to-speech Conversion," in *Proc. ITG*, (Achen, Germany), pp. 245–249, 2023
40) K. Scheck, D. Ivucic, Z. Ren, and T. Schultz, "Stream-ETS: Low-latency end-to-end speech synthesis from electromyography signals," in *Proc. ITG*, (Achen, Germany), pp. 200–204, 2023
41) L. Basso, Z. Ren, and W. Nejdl, "Towards efficient ECG-based atrial fibrillation detection via parameterised hypercomplex neural networks," in *Proc. EUSIPCO*, (Helsinki, Finland), pp. 1375–1379, 2023
42) Z. Ren, T. T. N. Nguyen, M. M. Zahed, and W. Nejdl, "Self-explaining neural networks for respiratory sound classification with scale-free interpretability," in *Proc. IJCNN*, (Gold Coast, Australia), pp. 1–7, 2023
43) T. T. Nguyen, Q.-D. Nguyen, Z. Ren, J. Jo, Q. V. H. Nguyen, and T. T. Nguyen, "10X faster subgraph matching: Dual matching networks with interleaved diffusion attention," in *Proc. IJCNN*, (Gold Coast, Australia), pp. 1–9, 2023
44) Z. Ren, T. T. Nguyen, Y. Chang, and B. W. Schuller, "Fast yet effective speech emotion recognition with self-distillation," in *Proc. ICASSP*, (Rhodes, Greece), pp. 1–5, 2023
45) Y. Chang, Z. Ren, T. T. Nguyen, K. Qian, and B. W. Schuller, "Knowledge transfer for on-device speech emotion recognition with neural structured learning," in *Proc. ICASSP*, (Rhodes, Greece), pp. 1–5, 2023
46) P. Wißbrock, Y. Richter, D. Pelkmann, Z. Ren, and G. Palmer, "Cutting through the noise: An empirical comparison of psychoacoustic and envelope-based features for machinery fault detection," in *Proc. ICASSP*, (Rhodes, Greece), pp. 1–5, 2023
47) K. N. D. Quach, Z. Ren, K. V. Tran, V. H. Vu, Y. Chun, T. T. Nguyen, and J. Jo, "Short-term traffic speed prediction using hybrid lstm-svr model," in *Proc. RiTA*, (Gold Coast, Australia), pp. 438–450, 2022
48) Y. Chang, Z. Ren, T. T. Nguyen, W. Nejdl, and B. W. Schuller, "Example-based explanations with adversarial attacks for respiratory sound analysis," in *Proc. INTERPSEECH*, (Incheon, Korea), pp. 4003–4007, 2022
49) Z. Ren, T. T. Nguyen, and W. Nejdl, "Prototype learning for interpretable respiratory sound analysis," in *Proc. ICASSP*, (Singapore), pp. 9087–9091, 2022
50) T. Yan, H. Meng, S. Liu, E. Parada-Cabaleiro, Z. Ren, and B. W. Schuller, "Convoluational transformer With adaptive position embedding For Covid-19 detection from cough sounds," in *Proc. ICASSP*, (Singapore), pp. 9092–9096, 2022
51) Y. Chang, Z. Ren, and B. W. Schuller, "Transformer-based CNNs: Mining temporal context information for multi-sound COVID-19 diagnosis," in *Proc. EMBC*, (Virtual), pp. 2335–2338, 2021
52) F. Hellmann, Z. Ren, E. André, and B. W. Schuller, "Deformable dilated faster R-CNN for universal lesion detection in CT images," in *Proc. EMBC*, (Virtual), pp. 2896–2902, 2021
53) P. Hecker, F. Pokorny, K. Bartl-Pokorny, U. Reichel, Z. Ren, S. Hantke, F. Eyben, D. Schuller, B. Arnrich, and B. W. Schuller, "Speaking Corona? Human and machine recognition of COVID-19 from voice," in *Proc. INTERSPEECH*, (Brno, Czech Republic), pp. 1029–1033, 2021
54) Z. Ren, J. Han, N. Cummins, and B. W. Schuller, "Enhancing transferability of black-box adversarial attacks via lifelong learning for speech emotion recognition models," in *Proc. INTERSPEECH*, (Shanghai, China), pp. 496–500, 2020
55) J. Han, K. Qian, M. Song, Z. Yang, Z. Ren, S. Liu, J. Liu, H. Zheng, W. Ji, T. Koike, X. Li, Z. Zhang, Y. Yamamoto, and B. W. Schuller, "An early study on intelligent analysis of speech under COVID-19: Severity, sleep quality, fatigue, and anxiety," in *Proc. INTERSPEECH*, (Shanghai, China), pp. 4946–4950, 2020
56) M. Albes, Z. Ren, B. W. Schuller, and N. Cummins, "Squeeze for sneeze: Compact neural networks for cold and flu recognition," in *Proc. INTERSPEECH*, (Shanghai, China), pp. 4546–4550, 2020
57) S. Liu, A. Triantafyllopoulos, Z. Ren, and B. W. Schuller, "Towards speech robustness for acoustic scene classification," in *Proc. INTERSPEECH*, (Shanghai, China), pp. 3087–3091, 2020
58) N. Cummins, Y. Pan, Z. Ren, J. Fritsch, V. Nallanthighal, H. Christensen, D. Blackburn, B. W. Schuller, M. Magimai.-Doss, H. Strik, and A. Härmä, "A comparison of acoustic and linguistics methodologies for Alzheimer's dementia recognition," in *Proc. INTERSPEECH*, (Shanghai, China), pp. 2182–2186, 2020
59) Z. Ren, A. Baird, J. Han, Z. Zhang, and B. W. Schuller, "Generating and protecting against adversarial attacks for deep speech-based emotion recognition models," in *Proc. ICASSP*, (Barcelona, Spain), pp. 7184–7188, 2020
60) Z. Yang, K. Qian, Z. Ren, A. Baird, Z. Zhang, and B. W. Schuller, "Learning multi-resolution representations for acoustic scene classification via neural networks," in *Proc. CSMT*, (Harbin, China), pp. 133–143, 2019
61) K. Qian, Z. Ren, F. Dong, W.-H. Lai, B. W. Schuller, and Y. Yoshiharu, "Deep wavelets for heart sound classification," in *Proc. ISPACS*, (Taipei, Taiwan), pp. 1–2, 2019
62) Z. Ren, J. Han, N. Cummins, Q. Kong, M. Plumbley, and B. W. Schuller, "Multi-instance learning for bipolar disorder diagnosis using weakly labelled speech data," in *Proc. DPH*, (Marseille, France), pp. 79–83, 2019
63) K. Qian, H. Kuromiya, Z. Ren, M. Schmitt, Z. Zhang, T. Naka-

mura, K. Yoshiuchi, B. W. Schuller, and Y. Yamamoto, "Automatic detection of major depressive disorder via a bag-of-behaviour-words approach," in *Proc. ISICDM*, (Xi'an, China), pp. 71–75, 2019

64) F. Ringeval, B. W. Schuller, M. Valstar, N. Cummins, R. Cowie, L. Tavabi, M. Schmitt, S. Alisamir, S. Amiriparian, E.-M. Messner, S. Song, S. Liu, Z. Zhao, A. Mallol-Ragolta, Z. Ren, M. Soleymani, and M. Pantic, "AVEC 2019 workshop and challenge: State-of-mind, detecting depression with AI, and cross-cultural affect recognition," in *Proc. AVEC*, (Nice, France), pp. 3–12, 2019
65) Z. Ren, Q. Kong, J. Han, M. Plumbley, and B. W. Schuller, "Attention-based atrous convolutional neural networks: Visualisation and understanding perspectives of acoustic scenes," in *Proc. ICASSP*, (Brighton, UK), pp. 56–60, 2019
66) J. Han, Z. Zhang, Z. Ren, and B. W. Schuller, "Implicit fusion by joint audiovisual training for emotion recognition in mono modality," in *Proc. ICASSP*, (Brighton, UK), pp. 5861–5865, 2019
67) Z. Ren, Q. Kong, K. Qian, M. Plumbley, and B. W. Schuller, "Attention-based convolutional neural networks for acoustic scene classification," in *Proc. DCASE*, (Surrey, UK), pp. 39–43, 2018
68) Z. Ren, N. Cummins, J. Han, S. Schnieder, J. Krajewski, and B. W. Schuller, "Evaluation of the pain level from speech: Introducing a novel pain database and benchmarks," in *Proc. ITG*, (Oldenburg, Germany), pp. 56–60, 2018
69) J. Han, Z. Zhang, M. Schmitt, Z. Ren, F. Ringeval, and B. W. Schuller, "Bags in bag: Generating context-aware bags for tracking emotions from speech," in *Proc. INTERSPEECH*, (Hyderbad, India), pp. 3082–3086, 2018
70) B. W. Schuller, S. Steidl, A. Batliner, P. Marschik, H. Baumeister, F. Dong, S. Hantke, F. Pokorny, E.-M. Rathner, K. Bartl-Pokorny, C. Einspieler, D. Zhang, A. Baird, S. Amiriparian, K. Qian, Z. Ren, M. Schmitt, P. Tzirakis, and S. Zafeiriou, "The INTERSPEECH 2018 computational paralinguistics challenge: Atypical & self-assessed affect, crying & heart beats," in *Proc. INTERSPEECH*, (Hyderbad, India), pp. 122–126, 2018
71) Z. Ren, N. Cummins, V. Pandit, J. Han, K. Qian, and B. W. Schuller, "Learning image-based representations for heart sound classification," in *Proc. DH*, (Lyon, France), pp. 143–147, 2018
72) J. Han, Z. Zhang, Z. Ren, F. Ringeval, and B. W. Schuller, "Towards conditional adversarial training for predicting emotions from speech," in *Proc. ICASSP*, (Calgary, Canada), pp. 6822–6826, 2018
73) Z. Ren, V. Pandit, K. Qian, Z. Yang, Z. Zhang, and B. W. Schuller, "Deep sequential image features on acoustic scene classification," in *Proc. DCASE*, (Munich, Germany), pp. 113–117, 2017
74) K. Qian, Z. Ren, V. Pandit, Z. Yang, Z. Zhang, and B. W. Schuller, "Wavelets revisited for the classification of acoustic scenes," in *Proc. DCASE*, (Munich, Germany), pp. 108–112, 2017
75) Z. Ren, Q. Zhang, H. Zhu, and Q. Wang, "Extending the FOV from disparity and color consistencies in multiview light fields," in *Proc. ICIP*, (Beijing, China), pp. 1157–1161, 2017
76) J. Deng, N. Cummins, J. Han, X. Xu, Z. Ren, V. Pandit, Z. Zhang, and B. W. Schuller, "The University of Passau open emotion recognition system for the multimodal emotion challenge," in *Proc. CCPR*, (Chengdu, China), pp. 652–666, 2016
77) Y. Zhang, F. Weninger, Z. Ren, and B. W. Schuller, "Sincerity and deception in speech: Two sides of the same coin? A transfer- and multi-task learning perspective," in *Proc. INTERSPEECH*, (San Francisco, CA), pp. 2041–2045, 2016

V. Dissertation

78) Z. Ren, *Deep learning techniques for computer audition*. PhD thesis, Faculty of Applied Computer Science, University of Augsburg, 2022

VI. Technical Reports

79) Z. Ren, Y. Chang, and B. W. Schuller, "The EIHW-GLAM deep attentive multi-model fusion system for cough-based COVID-19 recognition in the DiCOVA 2021 challenge," tech. rep., DiCOVA Challenge, 2021. 3 pages
80) Z. Ren, V. Pandit, K. Qian, Z. Yang, Z. Zhang, and B. W. Schuller, "A system for 2017 DCASE challenge using deep sequential image and wavelet features," tech. rep., DCASE Challenge, Munich, Germany, 2017. 1 page
81) S. Amiriparian, N. Cummins, M. Freitag, K. Qian, Z. Ren, V. Pandit, and B. W. Schuller, "The combined Augsburg/Passau/TUM/ICL system for DCASE 2017," tech. rep., DCASE Challenge, Munich, Germany, 2017. 1 page

VII. Patents

82) Q. Wang, Z. Ren, G. Zhou, and W. Zeng, "Light field acquisition device based on micro camera array and data processing method," 2022. No. CN106027861A
83) Q. Wang, Z. Ji, S. Han, C. Zhang, Z. Ren, and G. Zhou, "An equipment and algorithms for light field camera extrinsic parameters calibration," 2016. No. CN105654484