

Curriculum Vitae

Personal Details:

Name: Fars Samann

Date of Birth: June 22, 1988

Religion: Christianity

Current Positions:

1. Lecturer, Department of Biomedical Engineering, University of Duhok, Duhok, Kurdistan Region, Iraq
2. Researcher, Life Science Engineering, Technische Hochschule Mittelhessen (THM) – University of Applied Sciences, Gießen, Germany

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"Driven by curiosity, committed to discovery, and focused on impact."



Fars Samann

Other names

Department of Biomedical Engineering, University of Duhok, Kurdistan Region, Iraq

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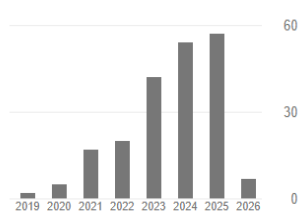
[Machine learning](#) [Biomedical Engineering](#) [Biomedical Signal Processing](#) [Denosing Autoencoder](#)

FOLLOWING

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TITLE	CITED BY	YEAR
<input type="checkbox"/> An efficient ECG denoising method using discrete wavelet with Savitzky-Golay filter F Samann, T Schanze Current Directions in Biomedical Engineering 5 (1), 385-387	49	2019
<input type="checkbox"/> RunDAE model: Running denoising autoencoder models for denoising ECG signals F Samann, T Schanze Computers in Biology and Medicine, 107553	22	2023
<input type="checkbox"/> Real-time Liquid Level and color Detection system using Image Processing FE SAMANN Academic Journal of Nawroz University (AJNU) 7 (4), 223-227	16	2018



Academic Qualifications:

- **B.Sc. in Electrical and Computer Engineering**
University of Duhok, Kurdistan Region, Iraq — *Awarded July 10, 2011*
Graduated **ranked 1st** out of 31 students with an average mark of 76.019%.
- **M.Sc. in Electronic Communications and Computer Engineering**
University of Nottingham, Nottinghamshire, UK — *Awarded December 12, 2014*
Graduated with **Distinction** and an average mark of 79%.
Thesis: *“Interchannel and Cross-Gain Crosstalk Effects in WDM Systems with SOAs”*
- **Dr.-Ing. (Doctor of Engineering Sciences) in Life Science Engineering**
Technische Hochschule Mittelhessen – University of Applied Sciences, Giessen, Germany — *Awarded March 25, 2025*
Achieved the **highest distinction “summa cum laude (0.7)”** for the dissertation titled:
“Towards Real-Time ECG Signal Denoising using Sparse and Shallow Running

Denoising Autoencoder”

Supervisor: Prof. Dr. Thomas Schanze

Email: thomas.schanze@lse.thm.de | **Mobile:** +49 157 5268 4002

Professional Experience:

1. Lecturer

Technische Hochschule Mittelhessen (THM)

September 2022 – September 2023

- Delivered lectures and practical sessions in the fields of Biomedical signal processing, Biomedical measurement techniques, and applications of AI in biomedical engineering.
- Developed and implemented a master’s level project titled “*Dipole Source Localization*” for Life Science Engineering students, as a part of the DAAD project “Bioniq- Bio/MedPhys”.

Academic Supervision

- **M.Sc. Thesis Co-Supervisor** at THM:
 - *Neural Networks for Spike Sorting Applications*
 - *Noisy ECG Cleaning Using Single- and Multi-layer Autoencoders Based on Signal Quality*
 - *ML-CDAE: Multi-lead Convolutional Denoising Autoencoder for 12-lead ECG Signal Denoising*
 - *Modeling and Localization of Electrical Signal Sources Using an L1-Regularized Multi-Monopole Approach*
- Co-supervised over 10 B.Sc. thesis projects in related engineering fields.

Administrative Role

- **Rapporteur**, Department of Electrical and Computer Engineering
October 2016 – February 2020
 - Responsible for departmental reporting, academic coordination, and administrative support.

Teaching Experience

Delivered both theoretical and practical instruction in the following subjects:

- Signals and Systems
- Communication Systems
- Advanced Communication
- Electrical Circuits
- Computer Networking (Practical)

Published Papers:

- [1] Alfa, M., Samann, F., & Schanze, T. (2026). ML-CDAE: Multi-Lead Convolutional Denoising Autoencoder for Denoising 12-Lead ECG Signals. *Signals*, 7(1), 18. <https://doi.org/10.3390/signals7010018>
- [2] F. Samann and T. Schanze, "AE-DD: Autoencoder-Driven Dictionary with Matching Pursuit for Joint ECG Denoising, Compression, and Morphology Decomposition," *AI*, vol. 6, no. 9, p. 234, Sep. 2025, doi: 10.3390/ai6090234. **(Impact factor=5)**
- [2] F. Samann, Towards Real-Time ECG Signal Denoising using Sparse and Shallow Running Denoising Autoencoder, Technische Hochschule Mittelhessen, 2025.
- [3] N. Busch, F. Samann, A. Neißner, M. Fiebich, and T. Schanze, "Denoising of low dose CT scans by means of Denoising Autoencoder," Abstracts of the 58th Annual Meeting of the German Society of Biomedical Engineering, 2024.
- [4] A. Prächte, F. Samann, and T. Schanze, "Implementation of running denoising autoencoder (RunDAE) on Arduino for real-time denoising of ECG," Abstracts of the 58th Annual Meeting of the German Society of Biomedical Engineering, 2024.
- [5] F. Samann, F. Hubich, T. Ott, and T. Schanze, "Automatisierungstechnik: Muscle fatigue detection based on sEMG signal using autocorrelation function and neural networks," De Gruyter, 2024.
- [6] F. Samann and T. Schanze, "Denoising by spectral selections of SVD representations of Hankel matricificated data with application to PPG signals," *IFAC-PapersOnLine*, vol. 58, no. 24, pp. 175–180, 2024.
- [7] F. Samann, F. Hubich, T. Ott, and T. Schanze, "Muscle fatigue detection based on sEMG signal using autocorrelation function and neural networks," at - *Automatisierungstechnik*, vol. 72, no. 5, pp. 408–416, 2024.
- [8] F. Samann and T. Schanze, "RESEMBLING THE MORPHOLOGIES OF ECG SIGNALS USING REGULARIZED DENOISING AUTOENCODER," *Passer Journal of Basic and Applied Sciences*, vol. 6 (Special Issue), pp. 341–351, 2024.
- [9] L. M. Meyer, F. Samann, and T. Schanze, "DualSort: online spike sorting with a running neural network," *Journal of Neural Engineering*, vol. 20, no. 5, p. 056031, 2023. **(Impact factor=4)**
- [10] F. Samann and T. Schanze, "RunDAE model: Running denoising autoencoder models for denoising ECG signals," *Computers in Biology and Medicine*, p. 107553, 2023. **(Impact factor=7)**
- [11] F. Samann, L. Meyer, and T. Schanze, "Removing noise and overlapping spikes from extracellular recordings using a regularized denoising autoencoder," *Current Directions in Biomedical Engineering*, vol. 9, no. 1, pp. 279–282, 2023.
- [12] F. Samann and T. Schanze, "Multiple ECG segments denoising autoencoder model," *Biomedical Engineering/Biomedizinische Technik*, vol. 68, no. 3, pp. 275–284, 2023. **(Impact factor=0.9)**
- [13] F. Samann and T. Schanze, "EMG based muscle fatigue detection using autocorrelation and k-means clustering," *Proceedings on Automation in Medical Engineering*, vol. 2, no. 1, p. 739, 2023.
- [14] L. M. Meyer, T. Schanze, and F. Samann, "A single-hidden-layer neural network for the

classification of spike-waveforms,” Proceedings on Automation in Medical Engineering, vol. 2, no. 1, p. 747, 2023.

[15] B. Marwan, F. Samann, and T. Schanze, “Cleaning Noisy ECG based on the Signal Quality with Single and Multiple Hidden Layer Autoencoder,” 2022 2nd International Conference on Intelligent Cybernetics Technology, 2022.

[16] B. Marwan, F. Samann, and T. Schanze, “Denoising of ECG with single and multiple hidden layer autoencoders,” Current Directions in Biomedical Engineering, vol. 8, no. 2, pp. 652–655, 2022.

[16] F. Samann and T. Schanze, “Multiple parallel hidden layers autoencoder for denoising ECG signal,” Current Directions in Biomedical Engineering, vol. 8, no. 2, pp. 161–164, 2022.

[17] F. Samann and T. Schanze, “Abstracts of the 2022 Joint Annual Conference of the Austrian (ÖGBMT), German (VDE DGBMT) and Swiss (SSBE) Societies for Biomedical Engineering,” Biomedical Engineering/Biomedizinische Technik, vol. 67, suppl. 1, pp. 1–580, 2022.

[18] F. Samann and T. Schanze, “Entrauschen von EKG-Signalen anhand von Autoencodern mit hybriden verborgenen Neuronenschichten,” DGMP 2022 – 53. Jahrestagung der Deutschen Gesellschaft für Medizinische Physik, 2022.

[19] F. Samann and T. Schanze, “Denoising biomedical signals via adaptive low-rank matrix representation by singular value decomposition using wavelets,” 2021 4th Int. Conf. on Bio-Engineering for Smart Technologies, 2021.

[20] F. Samann and T. Schanze, “Finding an optimal dictionary of different wavelet types using sparse modeling to denoise ECG signal,” Current Directions in Biomedical Engineering, vol. 7, no. 2, pp. 125–128, 2021.

[21] F. Samann and T. Schanze, “Use of a trained denoising autoencoder to estimate the noise level in the ECG,” Current Directions in Biomedical Engineering, vol. 7, no. 2, pp. 562–565, 2021.

[22] F. Samann, S. A. Bamerni, J. A. Khorsheed, and A. K. Al-sulaifanie, “Adaptive Real-Time Wavelet Denoising Architecture Based on Feedback Control Loop,” Journal of Engineering Research, vol. 9 (ICRIE Special Issue), pp. 1–18, 2021.

[23] F. Samann and T. Schanze, “On estimating the optimal autoencoder model for denoising ECG using Akaike Information Criterion,” AUTOMED - Automation in Medical Engineering, 2021.

[24] R. Bassam and F. Samann, “Smart Parking System based on Improved OCR Model,” IOP Conf. Ser.: Materials Science and Engineering, vol. 978, no. 1, p. 012007, 2020.

[25] M. Schubert, F. Samann, and T. Schanze, “An improved simple experimental setup for superimposed PPG signal separation,” Innovative digitale Verarbeitung bioelektrischer und -magnetischer Signale, 2020.

[26] M. Schubert, F. Samann, and T. Schanze, “QRS triggered averaging for superimposed PPG separation,” Proc. on Automation in Medical Engineering, vol. 1, no. 1, p. 014, 2020.

[27] M. Schubert, F. Samann, and T. Schanze, “Towards non-invasive fetal blood oxygen level acquisition: ECG-triggered separation of superimposed PPG,” 54th Annual Conference of the German Society for Biomedical Engineering, vol. 1, pp. 1–2, 2020.

[28] F. Samann, A. Rausch, and T. Schanze, “Electrical Dipole Source Localization using

Hybrid Least Squares Method in combination with ICA,” Current Directions in Biomedical Engineering, vol. 5, no. 1, pp. 361–364, 2019.

[29] F. Samann and T. Schanze, “An efficient ECG denoising method using discrete wavelet with Savitzky-Golay filter,” Current Directions in Biomedical Engineering, vol. 5, no. 1, pp. 385–387, 2019.

[30] F. E. Samann, “Real-time Liquid Level and color Detection system using Image Processing,” Academic Journal of Nawroz University (AJNU), vol. 7, no. 4, pp. 223–227, 2018.

[31] F. E. Samann and M. S. Hadi, “HUMAN TO TELEVISION INTERFACE FOR DISABLED PEOPLE BASED ON EOG,” Journal of University of Duhok, vol. 21, no. 1, pp. 54–64, 2018.

[32] F. E. Samann, “SIMPLE AND ROBUST EYE MOVEMENTS DETECTION METHOD,” Journal Of Duhok University, vol. 20, no. 1, pp. 152–163, 2017.

[33] F. E. Samann, “INTERCHANNEL AND CROSS GAIN CROSSTALK EFFECTS IN WDM SYSTEMS WITH SOAs,” Ph.D. thesis, University of Nottingham, UK.

Awarded Certificates and Appreciation Letter:

- Cisco certificate CCNA level 1 with honor
- Certificate from Adgar Kurd Scientific Group (4th IT Festival in Kurdistan)
- Certificate from Centre for English Language Education (CELE) with Distinction, awarded on 22nd of March 2013 from the University of Nottingham
- Certificate in Methods of Teaching from Training and Development Center/University of Duhok, awarded in May 2015
- Certificate from the 2nd international summer school in the module of “Signal and Image processing in Medicine” as a part of the master course of Biomedical Engineering, awarded on 10th of September 2019 with assessment of very good
- Appreciation letter from Dean of Engineering Department for receiving the best assessment in student feedback, portfolio and CAD, awarded on 23rd of April 2019
- Appreciation letter from Dean of Engineering Department for preparing the Design Day event 2019, awarded on 20th of May 2019

Reviewing Activities:

- **Biomedical Signal Processing and Control** (Elsevier) — Peer Reviewer
Reviewed 14 manuscripts | 2023–2025
- **Diagnostics, Epidemiologia, Sensors, Electronics, Applied Sciences, Mathematics** (MDPI) — Peer Reviewer Reviewed 15 manuscripts | 2025
- **Signal Processing: Image Communication** (Elsevier) — Peer Reviewer
Reviewed 2 manuscripts | 2025
- **Scientific Reports** (Springer Nature) — Peer Reviewer
Reviewed 1 manuscript | 2023
- **5th International Conference on Advanced Science and Engineering (ICOASE 2025)** — Reviewer
Reviewed 2 manuscripts | 2025

Committee Membership:

- Examination Committee at Electrical and Computer Engineering Department
- Examination Committee at Biomedical Engineering Department
- Quality of assurance Committee at Electrical and Computer Engineering Department
- Final Year projects Committee at Electrical and Computer Engineering Department
- Internship Committee at Electrical and Computer Engineering Department
- Science Committee at Biomedical Engineering Department
- Design Day of Biomedical Engineering Department Committee

Activities:

- Participating in Innovation Expo of Duhok Province Universities 2017 with project title “Adapted TV remote control using EOG”. This event was funded by European Union and implemented by UNDP.
- Participating in the 2nd International Summer School on Cyprus part of the master course of “Biomedical Engineering” of the module “Signal and Image processing in Medicine” (6 ECTS). (this program was Granted by DAAD).
- Participating in the DAAD project “Bioniq- Bio/MedPhys” to visit university of applied science, THM, Giessen in the period 1st of October 2018 to the 31th of December 2018, working on my PhD proposal in the field of Biomedical Engineering.
- Participate in the DAAD project “Sustainable Development of Biomedical Engineering in Northern of Iraq-SD-BIONIQ” to visit university of applied science, THM, Giessen in the period 1st of September 2019 to the 30th of November 2019, working on my PhD proposal in the field of Biomedical Engineering.
- Developing Msc project “LOCALIZATION OF MONOPOLE AND DIPOLE SOURCE IN 3 DIMENSIONS” for the Msc students of university of applied science, THM, Giessen as a part of the DAAD project “Bioniq- Bio/MedPhys”.
- Training on EEG recording in Azadi Hospital for three months since 27th of March 2019

Area of Interest:

- Sparse and redundant representations
- Bio-signals processing by artificial intelligence and machine learning
- Denoising bio-signals, e.g., ECG, via denoising autoencoder
- Biomedical signal processing
- Biomedical Engineering
- Digital Signal Processing