

Kianoosh Kazemi

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Summary

Doctoral researcher in Digital Health Technology at the University of Turku with hands-on experience in machine learning algorithms, MLOps, python programming, and signal and image processing. Skilled in Python, TensorFlow, and PyTorch, with experience in collaborative, multi-disciplinary research projects. In terms of soft skills, I have a reputation for self-learning, disentangling and simplifying complex problems, project planning, and presentation. These days, I am fully focused on learning about Generative AI, LLMs, and AI engineering.

Experience

Doctoral Researcher, University of Turku, Finland Sep. 2021 – Present

- **Design and implementation of Bio-signal processing tools:**

1. Design and release of PPG Signal Processing Pipeline. (e2epyppg: <https://pypi.org/project/e2epyppg/>)
2. Implementation of energy-efficient semi-supervised signal quality assessment method.
3. Design of PPG signal reconstruction based on Generative Adversarial Network.
4. Design and release of PPG peak detection method using dilated CNN approach.
5. Design and release of respiration rate estimation method for wearable devices.

- **Sleep Analysis methods for wearable devices:**

1. Sleep duration prediction using Smartring (OURA) physical activity parameter.
2. Sleep stage prediction using wearable device multimodal bio-signals.

- **Design and implementation of data collection setup using wearables**

1. Design and implement a setup using Samsung smartwatch and OURA ring for long-term data collection.
2. Design a simulating setup for fetal kicks detection using piezoelectric wearable garment and robotic arms.

Intern, Silicon Austria Labs, Austria Jan. 2022 – June 2022

- Design and Implementation of active and passive Metasurface lenses in 26GHz.
- Fingerprinting Indoor Localization Leveraging Channel State Information (CSI) and a multi-layer neural network to achieve accurate and scalable positioning, even in challenging environments.

Research Assistant, Amirkabir University of Technology, Iran Sep. 2018 – Feb. 2020

- Research on metamaterial-inspired surfaces for glucose monitoring.
- Design metamaterial antenna for 5G networks.

Education

University of Turku, Finland, Ph.D. in Information and Communications Technology Apr. 2021 – Present

- **Dissertation Title:** Digital Health Monitoring: Leveraging Wearable Devices and AI Solutions for Maternity care

AmirKabir University of Technology, Iran, Master of Science in Telecommunications Engineering Sep. 2017 – Feb. 2020

- GPA: 17.75/20
- **Thesis Title:** Analysis, Simulation and Design of material Characterization in Planar microwave structure

University of Shiraz, Iran, Bachelor of Science in Electrical Engineering Sep. 2013 – Sep. 2017

- GPA: 15.60/20
- **Project:** Design and Implementation of an Anti Theft Alarm (motion detector) using Arduino and GSM module (to send SMS alert)

Language

Persian (native), **English** (Fluent), **Finnish** (Beginner)

Achievements

- University of Turku Graduate School fund for performing Ph.D. research (19 months)
- Nokia Scholarship, encouragement grant 2024
- Finnish Foundation for Technology Promotion, encouragement grant 2024
- University of Turku Foundation, Travel grant for research visit

Skills and Expertise

- **Soft Skills:** Teamwork, Life-long learning, Adaptability, Academic writing and presentation
- **Programming Languages:** Python, R, Bash, SQL, MATLAB
- **Python packages:** Tensorflow, PyTorch, Pytorch-lightning, Transformers, Scikit-Learn, Ray, Mlflow
- **Tools:** Linux, Git (-hub, -lab), ADS, HFSS
- **Artificial Intelligence:** Classical machine learning, Deep learning, Neural architecture design, Feature engineering, Unsupervised and self-supervised learning, Causal Machine Learning

Publications

2025

Kazemi, K., Azimi, I., Liljeberg, P. and Rahmani, A.M., 2025, "Respiration Rate Estimation via Smartwatch-based Photoplethysmography and Accelerometer Data: A Transfer Learning Approach.", Proc. ACM Interact. Mob. Wearable Ubiquitous Technol. 9, 1. pp. 1-24.

Feli, M., **Kazemi, K.,** Azimi, I., Liljeberg, P. and Rahmani, A.M., "Multitask learning approach for PPG applications: Case studies on signal quality assessment and physiological parameters estimation", Comp.in Biol. and Med., Vol. 188.

2024

Kazemi, K., Abiri, A., Zhou, Y., Rahmani, A., Khayat, R.N., Liljeberg, P. and Khine, M., 2024. "Improved sleep stage predictions by deep learning of photoplethysmogram and respiration patterns.", Computers in Biology and Medicine, 179, p.108679.

Kazemi, K., Ryhtä, I., Azimi, I., Niela-Vilen, H., Axelin, A., Rahmani, A.M. and Liljeberg, P., 2024. "Impact of Physical Activity on Quality of Life During Pregnancy: A Causal ML Approach.", In 2024 46th Annual International Conference of the IEEE Engineering in Medicine & Biology Society (EMBC).

2023

Feli, M., **Kazemi, K.,** Azimi, I., Wang, Y., Rahmani, A.M. and Liljeberg, P., 2023, "End-to-End PPG Processing Pipeline for Wearables: From Quality Assessment and Motion Artifacts Removal to HR/HRV Feature Extraction.", In 2023 IEEE International Conference on Bioinformatics and Biomedicine (BIBM) (pp. 1895-1900).

Kazemi, K., Azimi, I., Liljeberg, P. and Rahmani, A.M., 2023, "Can Sleep Quality Attributes be Predicted from Physical Activity in Everyday Settings.", In 2023 45th Annual International Conference of the IEEE Engineering in Medicine & Biology Society (EMBC) (pp. 1-5). IEEE.

Kazemi, K., Azimi, I., Liljeberg, P. and Rahmani, A.M., 2023, "Robust CNN-based Respiration Rate Estimation for Smartwatch PPG and IMU.", In Proceedings of the 2023 10th International Conference on Bioinformatics Research and Applications (pp. 94-100).

2022

Sarhaddi, F., **Kazemi, K.,** Azimi, I., Cao, R., Niela-Vilen, H., Axelin, A., Liljeberg, P., Rahmani, A.M., "A comprehensive accuracy assessment of Samsung smartwatch heart rate and heart rate variability.", PLoS ONE 2022, 17, e0268361.

Kazemi, K., Laitala, J., Azimi, I., Liljeberg, P. and Rahmani, A.M., 2022. Robust ppg peak detection using dilated convolutional neural networks. Sensors, 22(16), p.6054.

Wang, Y., Azimi, I., **Kazemi, K.,** Rahmani, A.M. and Liljeberg, P., 2022, "Ppg signal reconstruction using deep convolutional generative adversarial network.", In 2022 44th Annual International Conference of the IEEE Engineering in Medicine & Biology Society (EMBC) (pp. 3387-3391). IEEE.

2021

Kazemi, K. and Moradi, G., 2021. Employing Machine Learning Approach in Cavity Resonator Sensors for Characterization of Lossy Dielectrics. International Journal of Information and Communication Technology Research, 13(3), pp.1-11.

Kazemi, K. and Moradi, G., 2021, May. Machine Learning Approach for Retrieval of Complex Permittivity in Cavity Resonators. In 2021 29th Iranian Conference on Electrical Engineering (ICEE) (pp. 874-880). IEEE.

Kazemi, K., Moradi, G. and Ghorbani, A., 2021. Employing higher order modes in a broadband SIW sensor for permittivity measurement of medium loss materials. International Journal of Microwave and Wireless Technologies, 13(8), pp.766-778.