



## Mojtaba Jafaritadi

Postdoctoral Research Fellow, Molecular Imaging Program at Stanford

### Bio

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#### BIO

Mojtaba Jafaritadi received his B.Sc. degree in Biomedical Engineering (EE), in 2012, M.Sc. in Biomedical Imaging from Åbo Akademi University BioImaging Master's Degree Program, and Ph.D. degree in Medical Physics and Engineering from the University of Turku, Finland, in 2014 and 2018, respectively. Prior to joining Stanford University, he was a Principal Lecturer in Artificial Intelligence at Turku University of Applied Sciences (TUAS), Senior Researcher at the University of Turku, Research Scientist in Precordior Company, and Doctoral Researcher at Turku PET Center in Finland. His research interests focus on motion estimation based on multidimensional MEMS sensors, 4D imaging, data- and device-driven respiratory and cardiac gating, signal processing, AI-enabled medical image processing, machine learning, and deep learning. Dr. Jafari has a strong interest in PET/MRI imaging, in particular, image reconstruction, head and body motion tracking, PET image denoising, synthetic image generator systems, and PET instrumentation.

#### HONORS AND AWARDS

- Postdoctoral Fellowship Grant (PET/MRI Motion Estimation and Correction), Ulla Tuominen Foundation (Postdoc Pool) (2021)
- Postdoctoral Grant (MEMS-Based Head Motion Tracking PET/MRI), Turku University Central Hospital Education and Research Foundation (2020)
- Smartphone Motion Processing for Atrial Fibrillation Detection, Finnish Foundation for Science and Technology (2018)
- Wearable Motion Processing System for Detecting Heart Arrhythmia Using MEMS Sensors, Nokia Foundation Awards (2017)
- Smartphone Motion Processing for Atrial Fibrillation Detection, Finnish Foundation for Science and Technology (2017)
- Wearable Motion Processing System for Detecting Heart Arrhythmia Using MEMS Sensors, Nokia Foundation Awards (2016)
- Doctoral Studies Scholarships, Faculty of Medicine, University of Turku (2015-2017)
- IEEE Young Trainee Grant, IEEE NSS/MIC (2016)
- Young Researcher award, University of Turku Foundation (2015)

#### PROFESSIONAL EDUCATION

- Ph.D., University of Turku , Medical Physics and Engineering (2018)
- M.Sc., Åbo Akademi University , Biomedical Imaging (2014)

#### STANFORD ADVISORS

- Craig Levin, Postdoctoral Faculty Sponsor

#### PATENTS

- Mojtaba Jafaritadi, Juhani Airaksinen, Tero Koivisto, Mikko Pänkäälä, Tuomas Valtonen. "United States Patent US20180303382A1 Method and apparatus for producing information indicative of cardiac condition", Precordior Oy, Oct 25, 2018

## LINKS

- Google Scholar: <https://scholar.google.fi/citations?user=HTVV-SoAAAAJ&hl=en>
- Research Gate: <https://www.researchgate.net/profile/Mojtaba-Jafari-Tadi>
- LinkedIn: <https://www.linkedin.com/in/mojtaba-jafari-tadi-65b1a451/>

## Research & Scholarship

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### CURRENT RESEARCH AND SCHOLARLY INTERESTS

Dr. Jafaritadi is working on the device- and data-driven motion estimation systems for brain PET imaging. His research focuses on motion tracking using multidimensional MEMS motion sensors, signal processing, and machine learning. He is also interested in working on data-driven motion correction and image enhancement for PET/MRI using deep neural networks.

### PROJECTS

- MEMS-based Head Motion Tracking for Brain PET/MRI

### LAB AFFILIATIONS

- Craig Levin, Molecular Imaging Instrumentation Laboratory (4/1/2021)

## Publications

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### PUBLICATIONS

- **A Computational Framework for Data Fusion in MEMS-Based Cardiac and Respiratory Gating.** *Sensors (Basel, Switzerland)*  
Jafari Tadi, M. n., Lehtonen, E. n., Teuho, J. n., Koskinen, J. n., Schultz, J. n., Siekkinen, R. n., Koivisto, T. n., Pänkäälä, M. n., Teräs, M. n., Klén, R. n.  
2019; 19 (19)
- **A novel dual gating approach using joint inertial sensors: implications for cardiac PET imaging** *PHYSICS IN MEDICINE AND BIOLOGY*  
Tadi, M., Teuho, J., Lehtonen, E., Saraste, A., Pankaala, M., Koivisto, T., Teras, M.  
2017; 62 (20): 8080–8101
- **Gyrocardiography: A New Non-invasive Monitoring Method for the Assessment of Cardiac Mechanics and the Estimation of Hemodynamic Variables** *SCIENTIFIC REPORTS*  
Tadi, M., Lehtonen, E., Saraste, A., Tuominen, J., Koskinen, J., Teras, M., Airaksinen, J., Pankaala, M., Koivisto, T.  
2017; 7: 6823
- **Classification of Atrial Fibrillation and Acute Decompensated Heart Failure Using Smartphone Mechanocardiography: A Multilabel Learning Approach** *IEEE SENSORS JOURNAL*  
Mehrang, S., Lahdenoja, O., Kaisti, M., Tadi, M., Hurnanen, T., Airola, A., Knuutila, T., Jaakkola, J., Jaakkola, S., Vasankari, T., Kiviniemi, T., Airaksinen, J., Koivisto, et al  
2020; 20 (14): 7957–68
- **Investigating the estimation of cardiac time intervals using gyrocardiography** *PHYSIOLOGICAL MEASUREMENT*  
Dehkordi, P., Tavakolian, K., Tadi, M., Zakeri, V., Khosrow-khavar, F.  
2020; 41 (5): 055004
- **Comprehensive Analysis of Cardiogenic Vibrations for Automated Detection of Atrial Fibrillation Using Smartphone Mechanocardiograms** *IEEE SENSORS JOURNAL*  
Tadi, M., Mehrang, S., Kaisti, M., Lahdenoja, O., Hurnanen, T., Jaakkola, J., Jaakkola, S., Vasankari, T., Kiviniemi, T., Airaksinen, J., Knuutila, T., Lehtonen, E., Koivisto, et al  
2019; 19 (6): 2230–42
- **Reliability of Self-Applied Smartphone Mechanocardiography for Atrial Fibrillation Detection** *IEEE ACCESS*  
Mehrang, S., Tadi, M., Hurnanen, T., Knuutila, T., Lahdenoja, O., Jaakkola, J., Jaakkola, S., Vasankari, T., Kiviniemi, T., Airaksinen, J., Koivisto, T., Pankaala, M.  
2019; 7: 146801–12

- **Stand-Alone Heartbeat Detection in Multidimensional Mechanocardiograms** *IEEE SENSORS JOURNAL*  
Kaisti, M., Tadi, M., Landenoja, O., Hurnanen, T., Saraste, A., Pankaala, M., Koivisto, T.  
2019; 19 (1): 234–42
  
- **Multiclass Classifier based Cardiovascular Condition Detection Using Smartphone Mechanocardiography** *SCIENTIFIC REPORTS*  
Iftikhar, Z., Landenoja, O., Tadi, M., Hurnanen, T., Vasankari, T., Kiviniemi, T., Airaksinen, J., Koivisto, T., Pankaala, M.  
2018; 8: 9344
  
- **A Miniaturized Low Power Biomedical Sensor Node for Clinical Research and Long Term Monitoring of Cardiovascular Signals**  
Tuominen, J., Lehtonen, E., Tadi, M., Koskinen, J., Pankaala, M., Koivisto, T., IEEE  
IEEE.2017
  
- **A real-time approach for heart rate monitoring using a Hilbert transform in seismocardiograms** *PHYSIOLOGICAL MEASUREMENT*  
Tadi, M., Lehtonen, E., Hurnanen, T., Koskinen, J., Eriksson, J., Pankaala, M., Teras, M., Koivisto, T.  
2016; 37 (11): 1885–1909