

# Tarek Hamid

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## RESEARCH INTERESTS

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Digital Health, Wearables, Biomedical Signal Processing, Machine Learning and Data Science for Health, Medical Cyber-Physical Systems, Ubiquitous and Mobile Computing

## EDUCATION

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- University of Virginia**, Charlottesville, VA *Present*  
PhD in Electrical and Computer Engineering  
Dissertation: *Multi-Wavelength PPG Algorithms for Wearable Non-Invasive Physiological Monitoring*  
Advisor: Prof. Amanda Watson
- University of Pennsylvania**, Philadelphia, PA *Aug 2023*  
M.S. in Computer Science
- Johns Hopkins University**, Baltimore, MD *Dec 2019*  
M.S. in Biomedical Engineering
- The College of New Jersey**, Ewing, NJ *May 2017*  
B.S. in Biomedical Engineering

## PUBLICATIONS

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1. *A Multi-Wavelength Optical Sensing Framework for Calibration-Free Wearable Blood Pressure Monitoring*  
**Tarek Hamid**, Patricia Flores, Jane Byun, Xi Chen, Haoran Zhang, Kyle Quinn, Amanda Watson  
International Conference on Acoustics, Speech, and Signal Processing (ICASSP) 2025.
2. *RapROTO: An Open-Source Platform for Rapid Prototyping with Wearable Devices.*  
**Tarek Hamid**, Kimberly Helm, Hyonyoung Choi, Jean Park, Claire Kendell, Stephanie Cummings, Steve Messe, Stefanie Modri, Insup Lee, Amanda Watson, James Weimer  
Proc. IEEE-EMBS Int. Conf. on Body Sensor Networks (IEEE BSN), 2024.
3. *Wearable Sensing for Measuring Skin-tone, Melanin, and Erythema.*  
**Tarek Hamid**, Anush Lingamoorthy, Kyle Quinn, and Amanda Watson  
Proc. IEEE-EMBS Int. Conf. on Body Sensor Networks (IEEE BSN), 2024.
4. *Using Decision Tree Classifier to Increase Screening Test Sensitivity for the Prediction of ACL Retear.*  
Tanishik Govil, **Tarek Hamid**, Kimberly Helm, Elliot Greenberg, Kevin Landrum, J. Todd R. Lawrence, Theodore J. Ganley, Amanda Watson  
UBICOMP'24: Adjunct Proceedings of the 2024 ACM International Joint Conference on Pervasive and Ubiquitous Computing, Melbourne, VIC, Australia 2024
5. *SpectraVue - An Interactive Web Application Enabling Rapid Data Visualization and Analysis for Wearable Spectroscopy Research.*  
**Tarek Hamid**, Insup Lee, Amanda Watson  
UBICOMP'23: Adjunct Proceedings of the 2023 ACM International Joint Conference on Pervasive and Ubiquitous Computing, Cancun, Mexico 2023
6. *Alleviation of Arthritic Symptoms through Thermal Therapy.*  
**Tarek Hamid**, Steven Ayala, Aakash Trivedi, Avi Shah  
In Proceedings of the 2017 Northeast Biomedical Engineering Conference (NEBEC). Newark, NJ: IEEE.

7. (Submitted) *Characterization and Feasibility of Wearable Spectroscopic Tracking of Nutrition Biomarkers*  
**Tarek Hamid**, Elizabeth Courtney, Patricia Flores, Jane Byun, Afsaneh Doryab, Sibylle Kranz, Amanda Watson  
 IEEE Pervasive Computing Special Issue on Biosensing.
8. (Submitted) *DermaGlow: Objective Quantification of Melanin, Erythema and Skin-tone Using Wearable Optical Spectroscopy*  
**Tarek Hamid**, Anush Lingamoorthy, Kyle Quinn, Amanda Watson
9. (Submitted) *Glucolux: Noninvasive Glucose Monitoring Using a Portable Spectroscopy Device*  
 Anush Lingamoorthy, Abhishek Murtha, **Tarek Hamid**, Kyle Quinn, Nagarajan Kandasamy, Amanda Watson

## INDUSTRY EXPERIENCE

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**VivoSense** Present  
*Algorithm Engineer* Remote

Developed algorithms and pipelines to process, analyze, and deliver wearables data from consumer smartwatches to pharmaceutical clients for use in clinical trials.

**Sotera Digital Health** Jul 2022 - Dec 2023  
*Biomedical Algorithm Engineer* Remote

Designed and implemented signal processing and data science algorithms in Python for a next-gen hospital wearable, extracting vital signs such as heart rate, SpO2, and blood pressure from ECG, PPG, and SCG sensor data.

**JPMorgan Chase** Jun 2020 – July 2022  
*Software Engineer* New York, NY

Developed algorithms and internal customer-facing applications to report on the stability of new code changes to the Chase Consumer application using Python, Java, Angular, and TypeScript.

**Department of Defense** Oct 2019 – June 2020  
*Electrical Engineer* Picatinny Arsenal, NJ

Designed custom hardware solutions for military vehicles using Altium.

**Johnson Johnson** Jan 2018 – Oct 2019  
*Scientist* Skillman, NJ

Led R&D lifecycle management activities for Class I and II consumer medical devices in the North American region.

## HONORS AND AWARDS

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**UVA Precision Health Initiative Grant** Feb 2025  
 Award of \$4,000 to cover travel expenses to present at ICASSP'25 in Hyderabad, India.

**Second Runner-up for Best Paper Award** Oct 2024  
 Presented Raproto: An Open-Source Platform for Rapid Prototyping with Wearable Devices at IEEE Body Sensor Networks.

## PROFESSIONAL SERVICE AND AFFILIATIONS

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Journal and Conference Reviews

1. *ACM Health* 2025
2. *IEEE Engineering in Medicine and Biology Society (EMBC)* 2024, 2025
3. *International Conference on Acoustics, Speech, and Signal Processing (ICASSP)* 2025
4. *Elsevier Smart Health* 2024

#### **Professional Affiliations**

1. *IEEE EMBS: Technical Community on Wearable Biomedical Sensors and Systems (WBSS)*
2. *IEEE*
3. *ACM*