Tarek Hamid

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RESEARCH INTERESTS

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

EDUCATION

University of Virginia, Charlottesville, VA *Present*
Ph.D. 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 (50% Completed)

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

1. *DermaGlow: Objective Quantification of Melanin, Erythema and Skin-tone Using Wearable Optical Spectroscopy*
   Tarek Hamid, Patricia Flores, Jane Byun, Elizabeth C. Courtney, Kyle C. Quinn, Amanda Watson
   Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies

2. *Characterization and Feasibility of Wearable Spectroscopic Tracking of Nutrition Biomarkers*
   Tarek Hamid, Elizabeth C. Courtney, Patricia Flores, Jane Byun, Afsaneh Doryab, Sibylle Kranz, Amanda Watson
   IEEE Pervasive Computing Special Issue on Biosensing.

3. *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.

4. *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.

5. *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.

6. *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

7. *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

8. *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.

9. *(In review) GlucoLux: Noninvasive Glucose Monitoring Using a Portable Spectroscopy Device*
   Anush Lingamoorthy, Abhishek Murtha, **Tarek Hamid**, Kyle Quinn, Nagarajan Kandasamy, Amanda Watson

INDUSTRY EXPERIENCE

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

SandboxAQ Global Travel Award *Aug 2025*
Award of $5,000 to cover travel expenses to present at UbiComp'2025 in Helsinki, Finland.

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

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*
4. *SIGCHI*