PERSONAL INFORMATION

MINH LONG HOANG

Parma (Italy)

Email: minhlong.hoang@unipr.it

ResearchGate:

Orcid ID: 0000-0002-3622-4327

Google scholar:

Scopus

WORK EXPERIENCE

01/11/2023 - now

Researcher and Assistant Professor in Electronic Engineering Department at University of Parma, Italy - Department of Medicine and Surgery, Interdepartmental Center for Sleep Disorders, University Hospital of Parma, Italy

I have been working as a researcher at the University of Parma on the National Recovery and Resilience Plan (PNRR) in DARE (Digital Lifelong Prevention) project, which applies Artificial Intelligence to health monitoring. The embedded system, microelectromechanical systems (MEMS) sensors, and automation are also included in the project. In addition, I have carried out well-being seminars to explain machine learning, microcontrollers, and Internet of Things (IoT) communication to students. During project, I have built a strong collaboration with Department of Medicine and Surgery, University of Parma and Interdepartmental Center for Sleep Disorders, University Hospital of Parma

Coordinator of Research Collaboration Project between Parma University and Baumer Company in the project “AI Application in Design and Characterization of the Kalman Filter parameters for a 6-axis angular sensor”.

Achieved Grant:

- Program Erasmus+ A.A. 2024/2025 in Staff Mobility for Teaching Abroad at University of the Basque Country, Bilbao, Spain. The course ‘Sensors in Automation and Artificial Intelligence Applications’ was carried out.

Teaching Activities:

- ‘Electronic Measurement’ course with laboratory activities at University of Parma, Italy.
- ‘ICT for Health and Well-Being’ course at University of Parma, Italy.
- ‘Advanced Programming with Python’ course for INES-Ruhengeri University, Rwanda, Africa as the part of collaboration with University of Parma, Italy.

Main Thesis co-supervisor activities for bachelor and master students:

- IoT Smart-Bed: Study of Algorithms for Breathing and Heartbeat Detection
- Analysis of the electronic devices disposal process
- Development of a system for a real-time monitoring of upper limb movements with 9-axis inertial measurement units
- Emergency system design for wearable devices
- Sleep Posture Classification with Deep Learning.

01/7/2022 - 31/10/2023

Postdoctoral Fellowship at the University of Parma, Italy (Industrial and Medicine Project)

I started multiple machine learning (ML) projects on sensors and electronics at the University of Parma, including sensor data management and artificial intelligence in computer vision. I have just finished a healthcare project about activity monitoring for weak people to guarantee their safety. The

research proposed a Parallel Training Logical Execution system using machine learning models on a microelectromechanical system accelerometer to detect coughs, falls, and other routine activities. The accelerations from the wearable device were sent to ML models via Wi-Fi with Message Queue Telemetry Transport (MQTT) broker, and activity predictions were transferred to the cloud for the family members or doctor care based on Internet of Things (IoT) communication. In addition, I work also on an Organ on a chip (OACC) project. With computer vision, I have to detect the motion of the cell. My tasks also include simulating, controlling, and designing the equipment for OACC models and incubator conditions.

01/06/2022 -30/06/2022

Collaboration in Research and Teaching on Data Measurement and Analysis based on Smartphone Sensors for Work-life Balance Monitoring at Hanoi University, Vietnam.

31/10/2021- 30/5/2022

Postdoctoral Fellowship at the University of Florence, Italy (Information and Electronic Engineering)

I worked at the University of Firenze for an Internet of things (IoT) project. The aim of project is to develop an alarm necklace with a tiny platform, included a Bluetooth chip with strong antenna and external circuit to guarantee the signal can reach the mobile app stably and support the mobile app development. Moreover, I also mentored an undergraduate student in research activities for his thesis on “Emergency system design for wearable device”

EDUCATION AND TRAINING

01/11/2018-31/10/2021

PhD in Industrial Engineering, University of Salerno, Fisciano, Italy

I worked on a Nationally Operative Program (PON) project of European Union about “Industry 4.0 oriented enhancement of Inertial Platform performance” as a PhD student at the University of Salerno, SA, Italy. Also, within this project, *I collaborated with Sensor System srl Company (Italy) and Baumer Company (Germany) as Researcher in R&D department in the field of inclinometer.*

The main aim is to research and develop the electronic system and positioning sensors such as Microelectromechanical systems (MEMS) sensors such as accelerometer, gyroscope and magnetometer to optimize the orientation performance. During the PhD period, the measurement and characterization were carried out for the sensor behaviour analysis as well as signal processing. Various types of software have been utilized like C/C++ program, MatLab, Python, Keil MDK, etc. The research experience has been accumulated from the university laboratory and company environment.

My main research interests include Inertial measurement unit (IMU) sensors, Microelectromechanical system (MEMS), Real-time measurements, Embedded systems, Signal processing, Machine learning Artificial Intelligence and Internet of Things (IoT).

10/2016-09/2018

Two-year master’s degree in electronic engineering

Università degli studi di Salerno, Fisciano (Italy)

Graduated in September 2018 – **110/110**

PERSONAL SKILLS

Mother tongue(s): Vietnamese

Foreign language(s)

	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken interaction	Spoken production	
Italian	B2	B2	B2	B2	B2
	Two-year Master's degree courses totally taught in Italian				
English	C1	C1	C1	C1	C1
	Bachelor's degree courses totally taught in English				

Levels: A1 and A2: Basic user - B1 and B2: Independent user - C1 and C2: Proficient user
Common European Framework of Reference for Languages

Organisational / managerial skills

Collaborator - Italian language and culture and International Mobility Center - Hanoi University (Vietnam) . Teamwork skill with other partners in multiple projects.

Job-related skills

- Good command of Microsoft Office
- Good in Matlab, Powersim simulation, Python, C/C++, LabView & Altium designer,
- Electronic Engineering: Orientation sensor, Inertial measurement unit (IMU) such as accelerometer, Microelectromechanical systems (MEMS), Electronic Power Circuit, Altium designer, Powersim simulation
- Applications of Electronic Engineering in the field of energy (Smart House e Smart Grid) and Photovoltaic System (MPPT, DC/DC Converter - Inverter)

CONFERENCE TECHNICAL COMMITTEES

2024 — Session Chair of the IEEE Instrumentation and Measurement Society (I2MTC 2024)

JOURNAL EDITORIAL COMMITTEES

2025-Present — ▪Journal Director/ Editor in Chief “Transactions on Intelligent Sensors and AI in Measurement and Methodology”, Open Academic Publishing (OAP).

2024 - Present — ▪ Guest Editor of Special Issue "Sensors Technologies for Measurements and Signal Processing" of MDPI Sensors.

2024 - Present — ▪ Topical Advisory Panel of Section "Physical Sensors" of MDPI Sensors.

2024 - Present — ▪ Academic Board Member of Global Open Share Publishing (GOSP).

2024 – Present — ▪ Youth Editorial Board Member of journal of AI+ (Artificial Intelligence +) - ISSN: 3007-7451

2024 – Present — ▪ Editorial Board member of Advances in Robotic Technology (ART)- ISSN :2997-6197

2023 – Present — ▪ Editor of Journal of Computer Vision Studies (CSV) - ISSN :2833-6070

2023 - Present ▪ Editorial Board Member of journal of International Journal of Sensors and Sensor Networks(IJSSN) – ISSN: 2329-1788

2023 - Present ▪ Guest Editor of Special Issue of Advanced Microelectromechanical Systems (MEMS) of MDPI journal.

CONFERENCE SPEAKER

2024 "Machine learning classification for failure analysis of smart spark plugs" at ESREF 2024, 35th European Symposium on Reliability of Electron Devices, Failure Physics and Analysis, Parma, Italy.

2024 "Image Processing System Based on Mesh Technology for Cell Kinematic Measurement," 2024 IEEE International Instrumentation and Measurement Technology Conference (I2MTC), Glasgow, United Kingdom.

2021 "Noise Attenuation on IMU Measurement For Drone Balance by Sensor Fusion". 2021 IEEE International Instrumentation and Measurement Technology Conference (I2MTC), Glasgow, Scotland,

2020 "A New Technique for Optimization of Linear Displacement Measurement based on MEMS Accelerometer" 2020 International Semiconductor Conference (CAS), Sinaia, Romania, 2020

2020 "Pre-Processing Technique for Compass-less Madgwick in Heading Estimation for Industry 4.0" 2020 IEEE International Instrumentation and Measurement Technology Conference (I2MTC), Dubrovnik, Croatia, 2020, pp. 1-6, doi: 10.1109/I2MTC43012.2020.9128969.

2020 "An Effective Method on Vibration Immunity for Inclinometer based on MEMS Accelerometer" 2020 International Semiconductor Conference (CAS), Sinaia, Romania, 2020, pp. 105-108, doi: 10.1109/CAS50358.2020.9267997.

2020 "A new orientation method for inclinometer based on mems accelerometer used in industry 4.0" IEEE 18th International Conference on Industrial Informatics (INDIN 2020), 2020.

RESEARCH ACTIVITY RECOGNITION

2024 Paper "Smart Drone Surveillance System Based on AI and on IoT Communication in Case of Intrusion and Fire Accident," has been promoted as a "Feature Paper" in MDPI Drones platform.

2022 Research activity was recognized by the University of Hanoi, Vietnam about project ' Data Measurement and Analysis based on Smartphone Sensors for Work-life Balance'.

PUBLICATIONS

BOOK

Minh Long Hoang , " Artificial Intelligence Development in Sensors and Computer Vision for Health Care and Automation Application ", Bentham Science Publishers (2024). https://doi.org/10.2174/9789815313055124010 1

JOURNAL ARTICLE

1. Minh Long Hoang , "A Review of Developments and Metrology in Machine Learning and Deep Learning for Wearable IoT Devices," in *IEEE Access*, vol. 13, pp. 106035-106054, 2025, doi: 10.1109/ACCESS.2025.3573937

2. Minh Long Hoang and Nicola Delmonte, "Digital Twin-Based Real-Time Monitoring System for Safety of Multiple Laptops in Working Environment," in IEEE Open Journal of Instrumentation and Measurement, vol. 3, pp. 1-9, 2024, Art no. 2000109, doi: 10.1109/OJIM.2024.3502879.

3. Minh Long Hoang, Mirco Mongilli, Guido Matrella, Paolo Ciampolini, Artificial intelligence prediction of maximum power point tracking voltage and current based on battery for sensor reduction and complexity minimization for photovoltaic charge controller, e-Prime - Advances in Electrical Engineering, Electronics and Energy, Volume 14, 2025, 101110, ISSN 2772-6711, https://doi.org/10.1016/j.prime.2025.101110 .

4. Minh Long Hoang et al . “Robust Automatic System for Spheroid Image-Processing of Kinematic Measurement and Evaluation.” *Measurement*, vol. 257, 2 Aug. 2025, pp. 118632–118632, https://doi.org/10.1016/j.measurement.2025.118632. Accessed 2 Sept. 2025.

5. Minh Long Hoang, Guido Matrella, and Paolo Ciampolini, “Metrological Evaluation of Contactless Sleep Position Recognition Using an Accelerometric Smart Bed and Machine Learning,” Sensors and Actuators A Physical, pp. 116309–116309, Feb. 2025, doi: https://doi.org/10.1016/j.sna.2025.116309.

6. Minh Long Hoang, Guido Matrella, and Paolo Ciampolini, “Artificial Intelligence Implementation into Internet of Things Embedded System for Real-time Person Presence in Bed Detection and Sleep Behaviour Monitor,”, Special Issue Internet of Things, Embedded Solutions, and Edge Intelligence for Smart Health, Electronics. 2024. https://doi.org/10.3390/electronics13112210

7. Mirko Hu , Flavia Bonalumi , Minh Long Hoang *et al.*, “Assessing the impact of air pollution on human embryonic cardioids using innovative longitudinal monitoring and machine learning,” *Vascular pharmacology*, vol. 155, pp. 107326–107326, Jun. 2024, doi: https://doi.org/10.1016/j.vph.2024.107326.

8. Minh Long Hoang, Guido Matrella, and Paolo Ciampolini, “Comparison of Machine Learning Algorithms for Heartbeat Detection Based on Accelerometric Signals Produced by a Smart Bed,” Sensors, vol. 24, no. 6, pp. 1900–1900, Mar. 2024, doi: https://doi.org/10.3390/s24061900.

9. Armel Asongu Nkembi, N. Delmonte, P. Cova, and Minh Long Hoang, “The Design and Dynamic Control of a Unified Power Flow Controller with a Novel Algorithm for Obtaining the Least Harmonic Distortion,” Electronics, vol. 13, no. 5, pp. 877–877, Feb. 2024, doi: https://doi.org/10.3390/electronics13050877.

10. Minh Long Hoang and N. Delmonte, “K-centroid convergence clustering identification in one-label per type for disease prediction,” IAES International Journal of Artificial Intelligence, vol. 13, no. 1, pp. 1149–1149, Mar. 2024, doi: https://doi.org/10.11591/ijai.v13.i1.pp1149-1159.

11. Minh Long Hoang, “Smart Drone Surveillance System Based on AI and on IoT Communication in Case of Intrusion and Fire Accident,” Drones, vol. 7, no. 12, pp. 694–694, Dec. 2023, doi: https://doi.org/10.3390/drones7120694.

12. Minh Long Hoang, M. Carratù, V. Paciello, and A. Pietrosanto, “Fusion Filters between the No Motion No Integration Technique and Kalman Filter in Noise Optimization on a 6DoF Drone for Orientation Tracking,” Sensors, vol. 23, no. 12, pp. 5603–5603, Jun. 2023, doi: https://doi.org/10.3390/s23125603

13. Minh Long Hoang, Armel Asongu Nkembi, and Phuong Ly Pham. 2023. "Real-Time Risk Assessment Detection for Weak People by Parallel Training Logical Execution of a Supervised Learning System Based on an IoT Wearable MEMS Accelerometer" Sensors 23, no. 3: 1516. https://doi.org/10.3390/s23031516

14. Minh Long Hoang, “Object size measurement and camera distance evaluation for electronic components using Fixed-Position camera,” Computer Vision Studies, Mar. 2023, doi: https://doi.org/10.58396/cvs020101

15. Minh Long Hoang, Antonio Pietrosanto “Yaw/Heading Optimization by Machine Learning Model based on MEMS Magnetometer under Harsh Conditions” in Measurements, Elsevier, Volume 193, 2022, https://doi.org/10.1016/j.measurement.2022.111013

16. Minh Long Hoang, Antonio Pietrosanto, “Yaw/Heading optimization by drift elimination on MEMS gyroscope” in Sensors and Actuators A: Physical, Science Direct, Vol. 325, 2021,

DOI: 10.1016/j.sna.2021.112691

17. Minh Long Hoang, Marco Carratù, Vincenzo Paciello, Antonio Pietrosanto, “Body Temperature—Indoor Condition Monitor and Activity Recognition by MEMS Accelerometer Based on IoT-Alert System for People in Quarantine Due to COVID-19” in Sensors MDPI, Special Issue Instrument and Measurement, 2021 DOI: 10.3390/s21072313

18. Minh Long Hoang and Antonio Pietrosanto, "New Artificial Intelligence Approach to Inclination Measurement based on MEMS Accelerometer," in IEEE Transactions on Artificial Intelligence,2021 doi: 10.1109/TAI.2021.3105494.

19. Minh Long Hoang, "Photovoltaic system optimization by new maximum power point tracking (MPPT) models based on analog components under harsh condition" Energy Harvesting and Systems, vol., no., 2021. https://doi.org/10.1515/ehs-2020-0001

20. Minh Long Hoang, Antonio Pietrosanto "A New Technique on Vibration Optimization of Industrial Inclinometer for MEMS Accelerometer Without Sensor Fusion" in IEEE Access, vol. 9, 2021, pp. 20295-20304, doi: 10.1109/ACCESS.2021.3054825.

21. Minh Long Hoang, Antonio Pietrosanto "A Robust Orientation System for Inclinometer With Full-Redundancy in Heavy Industry" in IEEE Sensors Journal, vol. 21, no. 5, 2021, pp. 5853-5860, doi: 10.1109/JSEN.2020.3040374.

22. Minh Long Hoang, Salvatore Dello Iacono, Vincenzo Paciello, Antonio Pietrosanto "Measurement Optimization for Orientation Tracking Based on No Motion No Integration Technique" in IEEE Transactions on Instrumentation and Measurement, vol. 70, 2021, pp. 1-10, Art no. 9503010, doi: 10.1109/TIM.2020.3035571.

CONFERENCE PAPER

1. Minh Long Hoang et al., "Image Processing System Based on Mesh Technology for Cell Kinematic Measurement," 2024 IEEE International Instrumentation and Measurement Technology Conference (I2MTC), Glasgow, United Kingdom, 2024, pp. 1-6, doi: 10.1109/I2MTC60896.2024.10561037.

2. Minh Long Hoang, Marco Carratù, Vincenzo Paciello, Antonio Pietrosanto “Noise Attenuation on IMU Measurement For Drone Balance by Sensor Fusion”. 2021 IEEE International Instrumentation and Measurement Technology Conference (I2MTC), Glasgow, Scotland, 2021, pp 1-6, doi: 10.1109/I2MTC50364.2021.9460041

3. Minh Long Hoang, Marco Carratù, Moise Avoci Ugwiri, Vincenzo Paciello, Antonio Pietrosanto "A New Technique for Optimization of Linear Displacement Measurement based on MEMS Accelerometer" 2020 International Semiconductor Conference (CAS), Sinaia, Romania, 2020

4. Minh Long Hoang, Antonio Pietrosanto, Salvatore Dello Iacono, Vincenzo Paciello "Pre-Processing Technique for Compass-less Madgwick in Heading Estimation for Industry 4.0" 2020 IEEE International Instrumentation and Measurement Technology Conference (I2MTC), Dubrovnik, Croatia, 2020, pp. 1-6, doi: 10.1109/I2MTC43012.2020.9128969.

5. Minh Long Hoang, Antonio Pietrosanto "An Effective Method on Vibration Immunity for Inclinometer based on MEMS Accelerometer" 2020 International Semiconductor Conference (CAS), Sinaia, Romania, 2020, pp. 105-108, doi: 10.1109/CAS50358.2020.9267997.

6. Minh Long Hoang, Marco Carratù, Vincenzo Paciello, Antonio Pietrosanto “A new orientation method for inclinometer based on mems accelerometer used in industry 4.0” IEEE 18th International Conference on Industrial Informatics (INDIN 2020), 2020.

7. Marco Carratù, Salvatore Dello Iacono, Minh Long Hoang, Antonio Pietrosanto "Energy characterization of attitude algorithms" 2019 IEEE 17th International Conference on Industrial Informatics (INDIN), Helsinki, Finland, 2019, pp. 1585-1590.