Jumana Ma'touq

Ph.D. Biomedical Engineering and Robotics

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Education

10.2015 - 10.2019 **Ph.D. Biomedical Engineering and Robotics**
Faculty of Electrical Engineering and Informatics,
Leibniz Universität Hannover,
Hanover, Germany
Dissertation: Human Hand Neuromechanics for the Design of Robotic Intelligent Upper Limb Prostheses
Grade: Magna cum laude (very good)
The first female doctoral graduate from the Institute of Automatic Control since establishment in 1963

09.2011 - 09.2012 **M.Sc. Medical Engineering**
School of Mechanical Engineering,
University of Leeds,
Leeds, United Kingdom
Grade: Distinction

09.2003 - 02.2008 **B.Sc. Biomedical Engineering**
Faculty of Engineering,
Jordan University of Science and Technology,
Irbid, Jordan
Grade: Very good

Professional Experience

02.2021 - Present **Assistant Professor**
Department of Biomedical Engineering,
School of Applied Medical Sciences,
German Jordanian University,
Amman, Jordan

10.2020 - 02.2021 **Part-time Lecturer**
Department of Biomedical Engineering,
School of Applied Medical Sciences,
German Jordanian University,
Amman, Jordan

02.2014 - 08.2015 **Lecturer**
Department of Biomedical Engineering,
School of Applied Medical Sciences,
German Jordanian University,
Amman, Jordan

01.2010 - 09.2011 **Teaching and Research Assistant**
Department of Biomedical Engineering,
School of Applied Medical Sciences,
German Jordanian University,
Amman, Jordan

Taught Courses and Laboratories

- Medical Signal Processing
- Medical Signal Processing LAB
- Medical Instrumentation I
- Medical Instrumentation II
- Signals and Systems
- Electrical Circuits LAB
- Digital Image Processing
- Medical Image Processing LAB
- Automatic Control Systems for Medical Applications
- Introduction to Biomedical Engineering
- Artificial Organs and Limbs
- Biomechanics I
- Biomechanics II
- Biomechanics LAB
- Biomaterials
- Biomaterials LAB
- Prosthetics and Artificial Organs
- Computer Application in Biomedical Engineering

Research interests

- Biomechanics and Neuromusculoskeletal Modelling
- Rehabilitation and Assistive Technology
- Machine Learning
- Virtual Reality in Healthcare and Education
- Medical Instrumentation and Technology
- Medical Image Processing

Selected Supervised Theses

- Knee Assistive Device, 2022, German Jordanian University
- Virtual Rehabilitation, 2022, German Jordanian University
- Virtual Biomechanics Lab, 2022, German Jordanian University
- Investigations of Designing an Automated Medical Dispenser, 2021, German Jordanian University
- Tremor Detection and Suppression in Parkinson's Patients, 2021, German Jordanian University
- Human Hand Dynamics Modelling: Implementation and Evaluation of Muscle Activation Estimation, 2019, Leibniz Universität Hannover
- Investigating the Implementation of Pneumatic Rubber Muscles in Upper Limb Exoskeleton Suit Controlled by Electromyography Signals, 2015, German Jordanian University
- Robotic Gripper Arm Based on Voice Recognition, 2014, Amman Al-Ahliyyah University
- Muscle Controlled Upper Limb Prosthesis, 2014, German Jordanian University
- Blind Assistive Technology Based on Android Platform, 2014, Amman Al-Ahliyyah University
- Drowsy Driver Alert System, 2010, German Jordanian University
- Neuro-Bridge, 2010, German Jordanian University

Funded Projects and Research Activities

- SEED Grant, Principle Investigator, Project: The Association Between Mobile Phone Usage and The Neuromusculoskeletal Complaints of The Upper Extremity, ≈36K EURO ,2022-2024, German Jordanian University, Jordan
- DAAD Research Grants - Doctoral Programmes in Germany, 2015, Germany

Academic Services and Other Activities

- Member of New Programme Committee (Health Intelligence), 2022, School of Applied Medical Sciences, German Jordanian University, Jordan
- Academic advisor for Biomedical Engineering students (Batch of 2019), Department of Biomedical Engineering, German Jordanian University, Jordan
- Attending DAAD Alumni Conference Digital Higher Education in Jordan, Iraq, and Lebanon, 2021, DAAD, Jordan
- Member of the School Council, 2021-2022, School of Applied Medical Sciences, German Jordanian University, Jordan
- Member of the Accreditation and Curriculum Committee, 2021-2022, Department of Biomedical Engineering, German Jordanian University, Jordan
- Member of the Scientific Research Committee, 2021-2022, Department of Biomedical Engineering, German Jordanian University, Jordan
- Preparing for the German Accreditation Committee meeting, 2021, Department of Biomedical Engineering, German Jordanian University, Jordan
- Attending Prophysics User Meeting, 2018, Germany
- Member of the jury in the 8th National Technology Parade, 2015, University of Jordan, Jordan
- Attending the First Scientific Conference, 2014, Faculty of Rehabilitation Sciences, The University of Jordan, Jordan
- Graduation Projects Coordinator, 2014-2015, Department of Biomedical Engineering, German Jordanian University, Jordan
- Member of the Accreditation Committee, 2014, Department of Biomedical Engineering, German Jordanian University, Jordan
- Member of the Tender Committee of Biomechanics and Biomaterials Labs, 2014, Department of Biomedical Engineering, German Jordanian University, Jordan
- Preparing the study plan for the BSc Biomedical Engineering program, 2014, Department of Biomedical Engineering, German Jordanian University
- Academic advisor for Biomedical Engineering students (Batch of 2013), Department of Biomedical Engineering, German Jordanian University, Jordan
- Pre-departure briefing for Saïd Foundation Scholars, 2013, British Council and Saïd Foundation, Jordan
- Student Representative, 2011-2012, School of Mechanical Engineering - University of Leeds, United Kingdom
- Preparing manuals for Medical Signal Processing Lab and Biomedical Instrumentation Lab, 2010-2011, Department of Biomedical Engineering, German Jordanian University

Awards

- DAAD Research Grants - German-Arab Transformation Partnership, 2021, Germany
- The 8th National Technology Parade Award, 2015, Jordan
- The 7th National Technology Parade Award, 2014, Jordan
- Said Foundation Scholarship, 2011, United Kingdom
- The Hisham Hijjawi Award, 2010, Jordan

Courses and Training

- E-learning Training, 2021, German Jordanian University, Jordan
- Robotics: Kinematics and Mathematical Foundations (Online), 2018, University of Pennsylvania, USA
- Machine Learning, 2017, Leibniz Universität Hannover, Germany

Publications

Journal Papers

- **Ma'touq J.** (2020). An Index Finger Musculoskeletal Dynamic Model. In: Ateshian G., Myers K., Tavares J. (eds) Computer Methods, Imaging and Visualization in Biomechanics and Biomedical Engineering. LNCVB, 36, pp. 411-436.
- **Ma'touq J.**, Hu T., and Haddadin S. (2019). A Validated Combined Musculotendon Path and Muscle-Joint Kinematics Model for the Human Hand. CMBBE, 22(7), pp. 727-739.
- **Ma'touq J.**, Hu T., and Haddadin S. (2018). Sub-millimetre Accurate Human Hand Kinematics: From Surface to Skeleton. CMBBE, 21(2), pp. 113-128.
- Al-Nabulsi J., **Ma'touq J.**, Abdullah E. E., Haloubi T., and Manasra A. (2017). Blind Users Assistive Technology Based on Android Platform. IJICA, 8(3), pp. 162-171.
- **Ma'touq J.**, Al-Nabulsi J., Al-Kazwini A., Baniyassien A., Al-Haj Issa G., and Mohammad H. (2014). Eye Blinking-Based Method for Detecting Driver Drowsiness. J Med Eng Technol, 38(8), pp. 416-419.
- **Ma'touq J.**, Messenger N., Strauss D., Tayebjee M., and Stewart T. (2014). Spinal Angle and Foot Pressure During Cardiac Electrophysiological Procedures. Int. J. Cardiol., 172(3), pp. 398-400.
- Fraiwan L., Al-Bataineh O., **Ma'touq J.**, Haddad S., and Bani-Amer M. (2009). ECG-based Wireless Home Infant Apnoea Monitor. J Med Eng Technol, 33(4), pp. 309-313.

Conferences

- **Ma'touq J.** (2019). Index Finger Musculoskeletal Dynamic Model, The 16th International Symposium on Computer Methods in Biomechanics and Biomedical Engineering, New York City, United States.
- **Ma'touq J.** (2019). An Anatomically Correct Human Hand Neuromusculoskeletal Model for Virtual Rehabilitation, Poster presentation at The 16th International Symposium on Computer Methods in Biomechanics and Biomedical Engineering, New York City, United States.
- Hu T., Kuehn J., **Ma'touq J.**, Haddadin S. (2018). Learning and Identification of Human Upper-Limb Muscle Synergies in Daily-Life Tasks with Autoencoders, OTWorld Congress 2018, Leipzig, Germany.
- Alfataftah M., Okal M., **Ma'touq J.**, Abu-Khalaf J. (2014). Muscle Controlled Bionic Hand (3D Printed Bionic Hand), The 9th Scientific Day of Biomedical Engineering, Jordanian Engineers Association, Amman, Jordan.