Nasim George Alnuman

Associate Professor

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Personal Information

- Date / Place of Birth: 4 June 1978 / Amman, Jordan
- Gender: Male
- Nationality / Citizenship: Jordanian
- Marital status: Married

Education

1.2006 – 5.2010 Technische Universität Darmstadt Darmstadt, Germany

- Ph. D. Student, the Department of System Reliability and Machine Acoustics, Technische Universität Darmstadt
- Research interest: Advanced multibody simulation of the human gait, Adaptive Systems, Prosthetics and Orthotics.
- Dissertation: Advanced Simulation of an Adaptive Lower Limb Prosthesis. Pub. Online: http://tuprints.ulb.tu-darmstadt.de/2149/

9.2001 – 2.2004 University of Jordan Amman, Jordan

- M. Sc. Degree in Mechanical Engineering.
- Graduate Average: 3.32/4.0 Rating: Very Good.
- Thesis: Thermal Contact Conductance of Elastically Deforming Flat Rough Surfaces Using Fractal Geometry.

9.1996 – 2.2001 University of Jordan Amman, Jordan

- B. Sc. Degree in Mechanical Engineering.
- Graduate Average: 3.38/4.0 Rating: Very Good.
- Graduation Project: Force-Motion Programming for Spring Loaded Mechanisms.
- Different projects in Machine Design, Dynamics of Machinery, Plumping, and Manufacturing Process.
- Training in Royal Jordanian Airline. (Including Departments of Service engineering, Ground Support, Engine overhaul, and Components shops).

1995 / 1996 Secondary Education National Patriarchal College Amman, Jordan

- General Secondary Education Certificate Examination 1996 – Scientific Stream
- Percentage Average: 94.8%

Work Experience

06.2020-Present Associate Professor/German-Jordanian University Amman, Jordan

9.2010 – 06.2020 Assistant Professor/German-Jordanian University Amman, Jordan

Associate professor at the department of Biomedical engineering. Teaching and research activities in biomedical engineering (Some taught courses: Biomechanics and Rehabilitation, Prosthetics and Orthotics, Artificial Limbs and Organs, Biomaterials, Biomedical Signals and Image Processing, Medical Imaging systems, Numerical Analysis, Research Design, Statistics and Probability).

Research activities and Interests: Prosthetics and Orthotics, Biomechanics, Noise in Industry and Noise Induced Hearing Loss, Modeling and simulation, Medical Signals and their applications (EEG and EMG), Energy Harvesting from Human Power.

Administrative tasks at the German-Jordanian University:

9.2017 – 4.2022 Director of Vision Rehabilitation Center

9.2016 – 9.2017 Head of Biomedical Engineering Department

5.2004 - 6.2005 Getzner Werkstoffe/Austria Amman, Jordan

Technical Engineer: Noise and Vibration Isolation. Vibration Isolation of machinery, trains, and buildings using polyurethane Materials. Structure and Air born sound isolation using different polyurethane and fiberglass materials. The work included design and installation.

8.2002 - 5.2004 Light Industry Company Amman, Jordan

Production and Maintenance Engineer: Manufacturing of car's radiators using copper and its alloys.

10.2001 - 7.2002 Q.A. Engineering Company Amman, Jordan

Design and Manufacturing Engineer: the work include designing and manufacturing of steel structures and machines (Pipe works, Cyclones, Cranes and End carriage, Belt conveyers, Grinder sieves).

Porfessional Qualifications and Certified Workshops

08.04.2021-03.06.2021 German-Jordanian University - CTC Amman, Jordan

The certified online course: "Online and Blended Learning", held from 08/04/2021 to 03/06/2021 with duration of 22 hours.

15.04.2016-15.04.2017 FH Luebeck & Universitaet zu Luebeck - Online Course - BioMedtec Wissenschaftscampus Luebeck, Germany

The certified online course: "Regulatory Affairs für die Medizintechnik", held from 15/04/2016 to 15/04/2017 with duration of 64 hours.

*30.05.2016-02.06.*2016 Royal Dutch Visio - Centre of Expertise for Blind & Partially Sighted People Nijmegen/Haren, Netherlands

Four days' workshop in Nijmegen and Haren. Lectures: Introduction to the area of Low Vision, Introduction to the area of Early Intervention, Vision in Children: normal and impaired, impacts of VI on development, visual issues in CP, CVI, MDVI. Lifestyle of multiple disabled and visually impaired persons and the relation with physiotherapy. Vision and Visual Rehabilitation in strokes, MS, Parkinson and neurological disorders. Physiotherapy for VI children.

03.2015-06.2015 Instituto De BiomecÁnica De Valencia – Online Course Valencia, Spain

The certified online course: "BIOMECHANICAL ASSESSMENT OF FOOT PATHOLOGIES, DESIGN AND MANUFACTURE OF ORTHOTIC SOLUTIONS", held from 10/03/2015 to 25/06/2015 with duration of 55 hours.

02.2012 British Council and Rolls Royce Amman, Jordan

Judge for the School Competition „Big Science Challenge: Water and Energy“ sponsored by Rolls Royce and the British Council.

03.2011 The institute of Physics (UK)/El Hassan Science City (JOR) Amman, Jordan

Intensive workshop on 'Entrepreneurship for Scientists and Engineers in Jordan' includes introduction to the process of innovation, generation and protection of intellectual property, technology transfer and commercialization of inventions.

03.2010 Deutsches Institute für Betriebswirtschaft (dib) GmbH Darmstadt, Germany

Seminar Serien on 'Neu in der Führungsrolle: die eigene Fähigkeit gezielt einsetzen und ,,Anfängerfehler'' vermeiden'.

(New in leadership: using the own skills goal oriented and avoiding starter mistakes)

07.2009 Fraunhofer Institute (LBF)/ TU Darmstadt - SzM Darmstadt, Germany

Workshop and seminar on 'Betriebsfestigkeit – Bauteilauslegung unter Schwingbeanspruch mit konstanten und variablen Amplituden' (System Firmness: Element construction and design under constant and changable forced vibration).

Scholarships

7.2005- 9.2009 KAAD Darmstadt, Germany

KAAD (Katholischer Akademischer Ausländer – Dienst) Scholarship for living expenses along the period of my PhD study in Germany.

Funded Projects and research activities

12.2015 – 12.2017 Scientific Research Support Fund (69,982 JoD - 100,000 $) Jordan

(co-applicant) A Combined EMG and EEG-based BCI System for Hand Motor Imagery Task Classification and Controlling Prosthetic Hand.

2.2015 – 8.2016 SRTD II(External Actions of the EU) (28,500 Euro – 33,000 $) EU/Jordan

Development of prototypes and experimental testing of modular artificial feet with adjustable adaptive ankle Joint.

7.2014- 7.2016 Scientific Research Support Fund (25,780 JoD - 36,000 $) Jordan

A 3-Dimensional model of the human body in walking for investigating the design and performance of lower limb prostheses.

7.2014- 10.2014 Faculty for Factory / Alhussein Society: Jordan Center for Training and Inclusion (4,000 JoD - 5,600 $) Amman, Jordan

1. Improving and developing the user safety of the wheel-chair lifting systems produced in the society workshops. 2. Exploring new uses of the plastic injection machine, and utilizing the wastes of polymers and gypsum from other processes in it.

7.2013- 9.2013 Guest Visit (DFG) (7,100 Euro - 9,400 $) Darmstadt, Germany

A Research stay in Germany in contact with TU Darmstadt (dept. of Information technology and dept. Of Mechantronics), research visit to Germany is organized in the period (20.06 – 20.09.2013). The research is about developing a 3-dimensional numerical model of the human being for use in evaluating the efficiency of modular adaptive prosthetic limbs.

7.2011- 9.2011 Faculty for Factory /KADDB (3,500 JoD - 5,000 $) Amman, Jordan

Market and Feasibility-Study of Manufacturing Artificial Limbs and their Components (Prosthetics) in Jordan.

Publications and Conferences

- **Alnuman, N.**, & AbuJbara, A.Video Games and the Prevalence of Musculoskeletal Disorders in Young Adults. 2022 Zooming Innovation in Consumer Technologies Conference (ZINC), 2022, pp. 34-38.
- **Alnuman, N.**, & Alshamasneh, A. (2022). The Effect of Inspiratory Muscle Training on The Pulmonary Function in Mixed Martial Arts and Kickboxing Athletes. *Journal of human kinetics*, *81*, 53–63. https://doi.org/10.2478/hukin-2022-0005
- Hadoush, H., Almasri, N. A., & **Alnuman, N.** (2022). The Effect of Bilateral Anodal Transcranial Direct Current Stimulation versus Treadmill Training on Brain Activities, Gait Functions, Level of Participation and Enjoyment of Children with Cerebral Palsy: A Randomized Controlled Trial Protocol. *Developmental neurorehabilitation*, *25*(2), 73–79. https://doi.org/10.1080/17518423.2021.1905730
- Qutishat, Y., Shublaq, S., Masoud, M., & **Alnuman, N.** (2020). Low Vision Profile in Jordan: A Vision Rehabilitation Center-Based Study. *Healthcare (Basel, Switzerland)*, *9*(1), 20. https://doi.org/10.3390/healthcare9010020
- **Alnuman, N.**, Al-Nasser, S., & Yasin, O. (2020). Classification of products preference from EEG signals using SVM Classifier. *2020 12th International Conference on Information Technology and Electrical Engineering (ICITEE)*. https://doi.org/10.1109/icitee49829.2020.9271669
- Khanfar, M. F., Abu-Nameh, E., Al Azizi, N., Abu Zurayk, R., Khalaf, A., Saket, M., & **Alnuman, N.** (2021). Electrochemical Determination of Sunset Yellow and Tartrazine at Carbon Electrodes Modified by Fe-Zr Oxide. *Jordan Journal of Chemistry*, *15*(3), 119–126. https://doi.org/10.47014/15.3.3
- **Alnuman, N.**, & Altaweel, M. Z. (2020). Investigation of the Acoustical Environment in A Shopping Mall and Its Correlation to the Acoustic Comfort of the Workers. *Applied Sciences*, *10*(3), 1170. https://doi.org/10.3390/app10031170
- Khanfar, M. F., Abu-Nameh, E., Saket, M., Al Khateeb, L., Al Ahmad, A., Asaad, Z., Salem, Z., & **Alnuman, N.** (2020). Detection of hydrochlorothiazide, sulfamethoxazole, and trimethoprim at metal oxide modified glassy carbon electrodes. *International Journal of Electrochemical Science*, 1771–1787. https://doi.org/10.20964/2020.02.35
- **Alnuman, N.**, & Ghnimat, T. (2019). Awareness of Noise-Induced Hearing Loss and Use of Hearing Protection among Young Adults in Jordan. *International journal of environmental research and public health*, *16*(16), 2961. https://doi.org/10.3390/ijerph16162961
- Khanfar, M. F., Al Absi, N., Abu-Nameh, E., Saket, M., Khorma, N., Al Daoud, R. & **Alnuman, N.** (2019). AG/AU modified Nafion coated glassy carbon electrode for the detection of Metronidazole. *International Journal of Electrochemical Science*, 3265–3280. https://doi.org/10.20964/2019.04.43
- **Alnuman, N.**, Al-Jafary, R., Manna, F., & Almuhtaseb, R. (2018). Fabrication and characterization of Electrospun 75:25 PLGA nanofibers for skin tissue engineering. *2018 IEEE-EMBS Conference on Biomedical Engineering and Sciences (IECBES)*. https://doi.org/10.1109/iecbes.2018.8626606
- Khalifeh, A. F., Saleh, A., AL-Nuimat, M., Abou-Tair, D., & **Alnuman, N.** (2019). Design and implementation of internet of things and cloud based platform for Remote Health Monitoring and Fall Detection. *New Technologies to Improve Patient Rehabilitation*, 84–97. https://doi.org/10.1007/978-3-030-16785-1_7
- Alazrai, R., Daoud, M. I., Khalifeh, A., **Alnuman, N.**, Mowafi, Y., & Alabed, D. (2019).

A wavelet-based approach for estimating the joint angles of the fingers and wrist using electromyography signals. *New Technologies to Improve Patient Rehabilitation*, 31–45. https://doi.org/10.1007/978-3-030-16785-1_3

- Alazrai, R., Alwanni, H., Baslan, Y., **Alnuman, N.**, & Daoud, M. I. (2017). EEG-Based Brain-Computer Interface for Decoding Motor Imagery Tasks within the Same Hand Using Choi-Williams Time-Frequency Distribution. *Sensors (Basel, Switzerland)*, *17*(9), 1937. https://doi.org/10.3390/s17091937
- **Alnuman, N.**, Khalil, A., & Ahmad, M. (2017). Digital Camera Based Motion Analysis Algorithm for Kinematic Gait Analysis. *16th ISPO World Congress 2017 in Cape Town, South Africa (International Society for Prosthetics and Orthotics (ISPO) (08-11.05.2017) Abstract Book*, paper number 594, page 379.
- **Alnuman, N.,** HajAbed, M., & Abdelqader, D. (2017) A Gait Emulator Based on Six-bar Mechanism for Testing Transtibial Prosthesis. *16th ISPO World Congress 2017 in Cape Town, South Africa (International Society for Prosthetics and Orthotics (ISPO) (08-11.05.2017) Abstract Book*, paper number 588, page 595.
- Alazrai, R., Alabed, D., **Alnuman, N.**, Khalifeh, A., & Mowafi, Y. (2016). sEMG-based approach for estimating wrist and fingers joint angles using discrete wavelet transform. *2016 IEEE EMBS Conference on Biomedical Engineering and Sciences (IECBES)*. https://doi.org/10.1109/iecbes.2016.7843519
- Alazrai, R., Alabed, D., **Alnuman, N.**, Khalifeh, A., & Mowafi, Y. (2016). Continuous estimation of hand's joint angles from SEMG using wavelet-based features and SVR. *Proceedings of the 4th Workshop on ICTs for Improving Patients Rehabilitation Research Techniques - REHAB '16*. https://doi.org/10.1145/3051488.3051498
- Alazrai, R., Khalifeh, A., **Alnuman, N.**, Alabed, D., & Mowafi, Y. (2016). An ensemble-based regression approach for continuous estimation of wrist and fingers movements from surface electromyography. *2016 38th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC)*. https://doi.org/10.1109/embc.2016.7590704
- M. Abuzeid, O., & **Alnuman, N.** (2013). Thermal contact conductance of elastically deforming nominally flat surfaces using fractal geometry. *Industrial Lubrication and Tribology*, *65*(6), 390–398. https://doi.org/10.1108/ilt-04-2011-0026
- Alnuman, N. (2010). *Advanced simulation of an adaptive lower limb prosthesis* (dissertation). TU Darmstadt, Darmstadt. Online: http://tuprints.ulb.tu-darmstadt.de/2149/

Presentations and Seminars

- Alnuman Nasim, “Simulation’s Role in the design of adaptive lower limb prosthesis”, was presented in the Sixth Rehab Science Day at the University of Jordan, Amman, 2012.
- Alnuman, Nasim, “Prosthetics, New Horizons”, was presented in the ministry of health, Al-Basheer Hospital, Amman, March, 2013.
- Alnuman, Nasim, “Advances in Prosthetics and Orthotics”, Al-Hussein Society: Jordan center for training and Inclusion, Amman, March, 2013.
- Alnuman Nasim, “Simulation of Lower Limb Prosthesis: Adaptation influence on gait parameters”, Conf. of Robotics: Science and Systems, Workshop: Towards Active Lower Limb Prosthetic Systems: Design Issues and Solutions, June 24-28, 2013, Berlin Germany.
- Alnuman Nasim, “A Thermoelectric cooling and energy harvesting system for the

sockets of artificial limbs", The First Scientific Conference for the Faculty of Rehabilitation Sciences, 6/5/2014, University of Jordan, Amman, Jordan.

- Alnuman Nasim, "The Role of Academic Research in the Assistance of Disabled Individuals. Case Study: The German-Jordanian University", International Conference on The Right of disabled persons, Environmental Accessibility and Reachability, 14/4/2015, The Hashemite University, Zarqa, Jordan.
- Nasim Alnuman, Haya Almusaddar, and Ali Abu-Abed, "An Economic EMG controlled Prosthetic Hand for Thumb Amputees", International Arabian Congress for Prosthetics & Orthotics, 15-17 April 2019, Amman-Jordan.

Sample Students' projects supervised

- Automated Diagnosis of Heart Diseases from processed Electrocardiogram Data
- Evaluation of Noise Level in Parties (Weddings) in Jordan and an Estimation their effects on hearing loss
- Arabic Speech Recognition
- 2-Dimensional Digital Gait Analysis System
- Human Body Energy Harvesting Using Thermocouples
- Thermal and Massage Therapy for Muscles Cramps
- Towards an EEG-controlled hand orthosis for Muscular Dystrophy patients
- Prosthetic Foot for Inclined Surfaces: Structural Design and Kinematic Study
- Screening of noise level in Jordanian Factories and a study of their effects on human ears
- A Structural Numerical Model of the Heart for Evaluation of Vibrational Changes in the Heart Wall Due to Heart Diseases
- Towards an Arabic Sign Language Detection System: Letter detection
- Design of an economic modular artificial foot with movable ankle joint: Construction and reliability study.
- Design of an economic modular artificial foot with movable ankle joint: Sensors and Feedback system.
- Design of an economic modular artificial foot with movable ankle joint: Actuators and Motion Control System
- Towards an Arabic Sign Language Detection System: motion patterns detection
- A Numerical model of the mitral valve for evaluation of heart sounds
- A Numerical Model of the Heart for the Evaluation of Heart Sounds Generated from Fluid-Myocardium Interaction due Heart Diseases
- The Relationship Between Pulse Oximetry Signals and Fluid Status in ADHF patients
- An Economic Electronic Artificial Hand, Part Two: Sensing System
- Test setup for Transtibial Prosthesis
- Noninvasive Measurement of Bone Characteristics Using Ultrasound
- Light Camera based Motion Analysis Algorithm for Abnormal Gait Detection
- An Economic Electronic Artificial Hand, Part One: Control System

- Simulation of Blood Flow and Right Atrium's wall expansion
- 3D printing an artificial hand and forearm that includes a wrist unit for better grasping capabilities
- Light Camera based Motion Analysis Algorithm for Abnormal Gait Detection
- Electro-spun Artificial Skin for Diabetic Ulcers Treatment
- Neuromuscular control for functional transradial prosthesis with minimal number of electrode setup
- Temperature Sense of an Artificial Hand
- Development of an economic multifunctional Hand prosthesis
- A study of touch and slip sensation of an artificial hand
- Mimic of Pressure Sensation of the Human Hand
- Computer based speech and hearing therapy
- Mobile based hearing aid

Academic Services

- Director of Vision Rehabilitation Center at the German-Jordanian University (2017-2022)
- Head of Biomedical Engineering Dept. year 2016/2017.
- Member of the Graduate Studies council (2016)
- Academic Committee of the Vision Rehabilitation Master Program, Deanship of Graduate Studies and Academic Research (2014-2016).
- Examination committee of the Vision Rehabilitation Master Students/Thesis (8 theses) (2012-2015).
- Preparation of the study plan for the Biomedical engineering dept. (2014)
- Accreditation committee member for the Biomedical engineering dept. (2014)
- Preparation and developing of Biomechanics Lab Manual.
- Preparation of Medical Signal and Image Processing Lab Manuals.
- Tenders preparation for Biomechanics and Biomaterials Labs.
- Tenders preparation for Medical Signal and Image Processing Labs.
- Tenders preparation for the Furnishing of the Pharmaceutical and Biomedical Labs. (23 Labs). (2014)
- Library committee member for the academic year 2010/2011
- Faculty council member for the year 2010/2011, 2014/2015
- Advisory for 2010, 2011, 2015, 2018students

Other activities, Student Activities and Community services

- Participation at the Red Bull Soapbox 100th Global Race in Jordan 2015. Include the design of motor free vehicle, classified within the best 15% in design, velocity and creativity.
- A member of the executive committee of the 2nd International medical/Scientific

conference of Al-Nadim Governmental Hospital, June 2015.

- Design and Painting the Walls for better accessibility for vision impaired persons. Al-Hussein society: Jordan center for training and Inclusion, 2014.
- Building models of the human body for vision impaired children for Royal Blind Academy in cooperation with the vision rehabilitation program at the GJU (2013-2014).
- Consultation for the student's club SoBiom (Society of Biomimetics) (2012-2014).
- Voluntary Consultant at Alhussein Society for Habilitation and rehabilitation, Workshop and Orthotics and Prosthetics dept. (since 2011).

Affiliations

03.2001- present Jordanian Engineers Association Amman, Jordan

01.2014- present International Society for Prosthetics and Orthotics (ISPO)

Awards

- Top 10 Scientific Paper Abstracts/Travel Grant SAGE and ISPO, South Africa 8-11.05.2017
- 3rd position in the NTP10 in Biomedical engineering application The national technological parade 2017 – German-Jordanian University 04.05.2017

Computer skills

- Multibody simulation (Simulation Programs SIMPack, ADAMS, and open source programs)
- FEM simulation (Ansys, and open source programs)
- MatLab and Simulink
- Autocad (2D, 3D) ForTran, Integration of FEM and MBS.
- Microsoft and Linux OS

Languages Arabic (fluently), English (very good), German (very good)

References Available upon Request