



MOUDAR ZGOUL

Associate Professor of Mechanical Engineering

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Amman - Jordan



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SUMMARY

With 20 years of experience, I bring expertise in Applied Mechanics, Computational Mechanics, CAD, Materials Testing, Artificial Intelligence, and Neural Networks to both research and teaching.

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EDUCATION

PhD, Mechanical and Aerospace Engineering, Solid Mechanics and Design, Adhesive Technology

University of Surrey, United Kingdom 1998-2002

PhD thesis: "Characterising the rate-dependent response of adhesively bonded structures"

MSc Mechanical Engineering

University of Jordan 1994 – 1997

BSc Mechanical Engineering

University of Jordan 1987 – 1992

EXPERIENCE

Associate Professor of Mechanical Engineering

University of Jordan Jul 2012 – Present

- I have conducted teaching and carried out research in the field of Applied Mechanics that served both undergraduate and graduate students.
- I have supervised projects in a range of areas including Structural Mechanics, AI and Neural Network applications in Mechanical Engineering, Simulation and Modelling, etc.

Assistant Professor of Mechanical Engineering

University of Jordan 2002 –2012

Lecturer/Lab Supervisor

University of Jordan 1995 – 1997

Taught several labs at the Mechanical Engineering Department and taught the Engineering drawing courses

Laboratory Engineer

University of Jordan 1992 – 1995

Taught Several laboratories in Applied Mechanics: Strength of Materials, Mechanical Vibrations, and Materials Lab.

Administrative Positions

Held Various Administrative positions:

- Chairman, Mechanical Engineering Department (Sep 2022 – Present) – University of Jordan
- Chairman, Mechanical Engineering Department (Dec 2015 - Sep 2017) - American University of Madaba - Jordan
- Assistant Dean for Training and Student Affairs and National Secretary of IAESTE Jordan (Sep 2012 - Sep 2014) - University of Jordan (www.iaeste.org)
- Assistant Dean for Student Affairs (Nov 2009 - Sep 2012) - University of Jordan
- Assistant Dean for Development and IT (Sep 2006 - Nov 2009) - University of Jordan
- Assistant Dean for Computer Affairs (Sep 2003 - Sep 2005) - University of Jordan

LANGUAGES

English
French



Arabic
German



SKILLS

- Simulation and CAD Software (Ansys, Abaqus, Fusion360)
- MATLAB, Python

RESEARCH INTERESTS

My research encompasses the following area: Materials and Structures, Stress Analysis and Finite Element Modeling, Virtual Testing of Adhesives and Polymers, Constitutive Laws and Finite Element Analysis of Bonded Structures, Rate-Dependent Response of Adhesive Materials, Computational Mechanics, Computer-Aided Engineering, Neural Network Implementation for Material Modelling, Artificial Intelligence, Augmented Reality and Neural Networks, Fluidic/Artificial Muscles, and Robotic Applications. Furthermore, I have interests in Computer Vision, Robotics Design and Control, Computer Vision for Drones, Robotics for Agriculture 5.0, and 3D Printing: Material Properties and modelling.

RESEARCH GRANTS

- Deutsche Forschungsgemeinschaft (DFG) fellowship: Technical University of Braunschweig-Institute für Füge- und Schweißtechnik, Germany, June/2008-September/2008. Worked on generating experimental data on rate dependent adhesive materials for the purpose of creating a material model that can be integrated within the finite element code.
- Deutsche Forschungsgemeinschaft (DFG) fellowship: Technical University of Braunschweig-Institute für Füge- und Schweißtechnik, Germany, June/2009-September/2009. Worked on simulating bonded joints using the finite element method and on developing a technique for testing adhesive materials using x-ray diffraction methods.

PROFESSIONAL TRAINING AND ACTIVITIES

- Training of Trainers workshop (April 2004) – Amman.
- Training Trainers for TEMPUS and other programs (equivalent to 2 ECTS), Tempus-Meda project SCM M007A04 (July 2005) – Amman.
- Quality infrastructure-accreditation and conformity assessment bodies-concepts and requirements - ISO17025 (Dec 2004) – Amman.
- European Product safety Legislation/The New Approach Directives-Toy Directives (April 2006) – Amman.
- G.U.N.T. Laboratory training on Strength of Materials equipment (May 2006) – Amman.
- Refresher training: Technical Policies of Accreditation and Assessment reports (June 2006) – Amman.
- Youth invitation program – ICT in Education (Feb 2005 - Mar 2005) – Japan.
- Creative thinking skills, Egypt (April 2006).
- Summer School in Mechatronics and Microsystems “Mecmic06”, Germany (August 2006).
- Technical Aspects in Accreditation: Proficiency Testing schemes in the Mechanical Field (July 2007)-Amman.
- Refresher Course – Accreditation Unit – Jordan Accreditation System - (July 2007)-Amman.
- ‘Faculty-For-Factory’ program of collaboration between the University of Jordan and Jordanian industries: worked on developing technical data sheets for locally produced adhesive materials.
- Leadership in Higher Education (October 2008) – Amman.
- FP7 week, May 2010 (FP7 proposal writing, partnering, evaluation, and contract negotiation).
- Producing Multimedia for E-learning (October 2010)- Amman.
- Wed-Based, multi-media and interactive education (self-development work).

- Refresher training session – Accreditation Unit – Jordanian Accreditation System (JAS). July 2012 – Amman
- Microsoft in Education certificate: Certified Microsoft Innovative Educator. November 2020
- Conformity assessment - Fundamentals of product certification and guidelines for product certification schemes, ISO/IEC 17067:2013 Amman, March 2021.
- Quality Management System, ISO9001, January 2022. ONLINE.

MEMBERSHIP AND AFFILIATION

- Technical committee for accreditation-Mechanical Engineering, Material Science and Proficiency tests- Jordan Accreditation System (JAS).
- Technical committee for pressure vessels and pressure equipment, Jordan Standards and Metrology Organization (JSMO)
- Technical team for ISO17025 audits/ Technical Assessor-Jordan Accreditation System (JAS)
- Royal Institute of Materials, UK
- Society for adhesives and adhesion, UK
- The Welding Institute (World Centre for Materials Joining Technology), UK
- Advisory committee, International Energy Foundation, UK
- Jordan Engineers Association

PUBLICATIONS

1. Zurigat, Y.H., Hammad, M.A., **Zgoul, M.H.**, Jaber, L.T. and Al-Nsour, S.R., "*The Potential Use of Evacuated-Tube Solar Collector for Absorption Refrigeration Systems*", Proceedings of the Second International Conference on Refrigeration and Air-Conditioning, April 18-20, Amman-Jordan, pp. 141-153, 1992.
2. A.D. Crocombe and **M. Zgoul**, "*Characterising the rate dependent response of adhesively bonded joint*", 5th European Adhesion Conference, EURADH 2000, Lyon, France, 2000.
3. Crocombe A. D. and **Zgoul M**, "*Predicting the strength of bonded joints tested at different rates*", 25th Annual Meeting of the Adhesion Society, Inc, and The 2nd World Congress on Adhesion and Related Phenomena (WCARP-II), Orlando, FL, Feb. 12, 2002.
4. **M. Zgoul** and A.D. Crocombe, "*Numerical modelling of lap joints bonded with a rate-dependent adhesive*" International Journal of Adhesion and Adhesives, Volume 24, Issue 4, August 2004, Pages 355-366.
5. A. Abu Ghanimeh, S. Abu-Ghazalah, **M. Zgoul** and W. Al-Azhari, "*The use of computers in architectural research and practice in Jordan*", 4th FAE International Symposium, Lefke, Cyprus, 2006.
6. **M. Zgoul**, "*Virtual Testing of Adhesive Materials*", The 3rd World Congress on Adhesion and Related Phenomena, WCARP-III, 15~18 Oct., 2006, Beijing, PR China.
7. M.S. Shawaqfah, R.A. Damseh, A.J. Chamkha, H.M. Duwairi, **M.H. Zgoul**, "*Forced Convection of Blasius Flow of "Second-Grade" Visco-Elastic Fluid*", International Journal of Heat Technology, Volume 25, No. 1, June 2007, pp. 145-150.
8. **Moudar Zgoul** and Saad Habali, "*Bendy Signposts and Street Lights for Better Safety*", 12th Conference for Computer Aided Engineering and System Modeling", 2007, Turkey.
9. **M. H. Zgoul** and S. Habali, "*An investigation into Plastic Pipes as Hot Water Transporters in Domestic and Industrial Applications*", Jordan Journal of Mechanical and Industrial Engineering, Volume 2, No. 4, December 2008, pp 191-200.
10. **M. H. Zgoul** and M. I. Kilani, "*Development of a multimedia toolkit for Engineering Graphics Education*", iJET – Volume 4, Issue 3, September 2009.
11. A. Al-Salaymeh, **M. Zgoul**, H. Khalidi and S. Habali, "*Wind-Energy Augmentation Using the Delta-Wing Vortex*", Dirasat, University of Jordan, Volume 37, Engineering Sciences, Number 1. April 2010, pp. 13-26.

12. **Moudar H. Zgoul**, "Predicting the mechanical behavior of steel frames exposed to elevated temperatures using artificial neural networks", WSEAS TRANSACTIONS on SYSTEMS, Volume 9, issue 8, August 2010, pp. 895-904.
13. **M.H. Zgoul** and M. Abu-Zurayk, "A CRASH SIMULATION OF AN OFF-ROAD VEHICLE", International Conference on Applied Mechanics, Materials and Manufacturing, ICAMMM 2010, Sultan Qaboos University, 13-15 December, Oman.
14. **M. Zgoul**, B. Ziadeh, R. Al-Dirini and O. Abdeen, "DEVELOPMENT OF A BRAKE-BY-WIRE SYSTEM", 5th International Conference on Advances in Mechanical Engineering and Mechanics ICAMEM2010, 18-20 December 2010, Hammamet, Tunisia.
15. **Moudar Zgoul** and Idriss El-Thalji, "Wind Energy Operation and Maintenance Practices in Desert Climate: threats, challenges and solutions" Global Conference on Renewables and Energy Efficiency for Desert Regions, GCREEDER 2011, Amman-Jordan, April 26th – 28th 2011.
16. **Moudar Zgoul**, "Modelling Rate Dependent Behaviour in Adhesively Bonded Joints Using Artificial Neural Networks" Eleventh International Conference on the Science and Technology of Adhesion and Adhesives, National Science Learning Centre, University of York, UK, 7 - 9 September 2011.
17. **M.H. Zgoul**, A. Alzamer, M. R. Elayyan and M. A. Quran, "Static Analysis of a Tensegrity Bridge using the Finite Element Method", International Conference on Applications and Design in Mechanical Engineering (ICADME 2012), Malaysia, 27-28, February 2012.
18. **Moudar H. Zgoul**, "Use of Artificial Neural Networks for Modelling Rate Dependent Behaviour of Adhesive Materials", International Journal of Adhesion and Adhesives, Volume 36, July 2012, Pages 1-7.
19. **Moudar Hamed Zgoul**, Hashem Saleem Alkhalidi, Saad Mohammad Habali, Mu'tasim Soud Abdel-jaber and Bassam Mohammed Ziadeh, "Failure Investigation of Reinforced Concrete Columns Exposed to Fire", Dirasat, volume 39, No. 1, 2013.
20. A.T. Al-Halhouli, M. Abu Rumman, **M. Zgoul**, "Design and Testing of a Meso-Scale Pneumatic Actuated Electrical Power Generator" Int. J. of Thermal & Environmental Engineering Volume 10, No. 1 (2015) 63-67.
21. **Moudar H. Zgoul**, "Computational Aerodynamics Optimization of Wind Turbine's Blade Twist Angle", World Congress and Exhibition on Wind & Renewable Energy, Berlin, Germany, July 28-30, 2016
22. Malak Al-Ma'a'ita, **Moudar Zgoul**, Mohammad Al Janaideh, "Hysteresis Nonlinearities in Pneumatic artificial Muscles", Proc. of the Fourth International Conference on Advances in Mechanical and Robotics Engineering - AMRE 2016, 15-16 December 2016, Rome, Italy
23. **M. Zgoul**, J. Yamin and Y. Yousef, "Analysis of Mechanical and Thermal Stresses on Connecting Rod/Piston of a Variable Compression Ratio Engine Powered by Biodiesel", International Journal of Mechanical And Production Engineering, ISSN: 2320-2092, Volume- 5, Issue-8, Aug.-2017.
24. **Moudar H. A. Zgoul**, Amin Al Zamer, "Evaluation of the Elastic Mechanical Properties of a Hybrid Adhesive Material" World Academy of Science, Engineering and Technology International Journal of Mechanical and Materials Engineering, Vol:11, No:12, 2017.
25. Oweis, K., Quteishat, H., **Zgoul, M.**, & Haddad, A. A Study on the Effect of Sports on Academic Stress Using Wearable Galvanic Skin Response. 2018 12th International Symposium on Medical Information and Communication Technology (ISMICT). doi:10.1109/ismict.2018.8573736. (2018).
26. Malak Al-Ma'a'ita, **Moudar Zgoul**, Mohammad Al Janaideh, "Experimental Hysteresis Characterization in Pneumatic Artificial Muscles", IEEE Jordan International Joint Conference on Electrical Engineering and Information technology (JEEIT), DOI: 10.1109/JEEIT.2019.8717405, 2019.
27. Abu Mohareb, Saad, Adham Alsharkawi, and **Moudar Zgoul**, "Hysteresis Modeling of a PAM System Using ANFIS" Actuators 10, no. 11: 280. doi.org/10.3390/act10110280, 2021.
28. Mohammad Al Saaideh, Husam Khasawneh, **Moudar Zgoul**, Malak Al-Ma'a'ita, Mohammad Al Janaideh, "A hyperbolic-based Prandtl-Ishlinskii Model for a Loaded Pneumatic Artificial Muscle Actuator", IEEE Jordan International Joint Conference on Electrical Engineering and Information Technology (JEEIT), DOI: 10.1109/JEEIT53412.2021.9634096, 2021.

29. Zayd Ayman Khashshan and **Moudar Hamed Zgoul**, “Optic Flow-based Vision System for Autonomous and Collision-free Navigation of Micro Aerial Vehicles”, 2021 Global Mosharaka Congress on Electrical Engineering (GC-ElecEng 2021), 10-11 December 2021 (Remotely), Valencia, Spain.
30. Ayeh Arabiat, Mohammad Matahen, Omar Abu Zaid and **Moudar Zgoul**,” Control of an Exoskeleton for Lower Limb Rehabilitation Using ANFIS”, International Journal of Online and Biomedical Engineering, Vol. 18 No. 15, 2022. <https://doi.org/10.3991/ijoe.v18i15.33805>