

“Prof. Dr. Ala'aldeen Al-Halhouli”**President**

German Jordanian University
P.O. Box 35247, Amman 11180, Jordan
Cell: +962 79 6565 943
E-mail: alaaldeen.alhalhouli@gju.edu.jo

**Visiting Researcher and Privatdozent at the Institute of Microtechnology (IMT),
Technische Universität Braunschweig, Germany**

Founder and PI of the NanoLab @ GJU: <http://nanolab.gju.edu.jo>

BIOGRAPHY

Ala'aldeen Al-Halhouli is the President of the German Jordanian University, in Amman, Jordan. He is a Professor of mechanical engineering at the mechatronics engineering department at the German Jordanian University. He obtained a B.Sc. degree in Mechanical Engineering from Mu'tah University, Jordan in 1999, a M.Sc. degree in Mechanical Engineering from the University of Jordan in 2001, a Ph.D. degree in Mechanical Engineering from the University of Jordan in 2007 and a habilitation degree with Venia Legendi on microfluidics from the Mechanical Engineering Faculty at the “Technische Universität Braunschweig (TU BS)” in Germany in 2013. In 2005, Dr. Al-Halhouli received a DAAD scholarship to conduct his Ph.D. research in the area of viscous micropumps at the Institute of Microtechnology (IMT) of TU BS. Between 2007 and 2013, he was working as a research associate and lecturer at IMT. During the summer of 2014, he was a visiting scientist at Micro/Nanofluidic BioMEMS group, Massachusetts Institute of Technology (MIT), USA. He was a visiting Professor at the Nano lab of Tufts University, USA in June 2015 and has a visiting scholar status at IMT since Feb. 2013. He was the Dean of the School of Applied Technical Sciences and the Dean of the School of Applied Humanities and Languages at GJU. He served as vice president and then president of the Middle East University in Amman, Jordan between 2019-2021. Dr. Al-Halhouli believes on the concept of “from idea to product”, therefore he established the Nanolab @ GJU on May 2016 and currently leading several R&D projects with national and international colleagues and companies.

Dr. Al-Halhouli has special interest in customized electromechanical systems and their design, simulation, fabrication and testing, such as microfluidic systems for biomedical applications, high throughput rare cells separation utilizing inertial microfluidics, food and water monitoring and point of care (POC) diagnostics for low resource settings. He has novel projects on inkjet printed electronics, and nanomaterials for future energy. Moreover, Dr. Al-Halhouli is the general coordinator of one Erasmus+ capacity-building project on Socio-economic impact of renewable energy and energy efficiency (named DESIRE) and partner in two other projects on smart grid, environment and climate change.

Dr. Al-Halhouli published more than 70 papers in international Journals and conference proceedings. He received several Awards such as the GJU distinguished researcher Award, Amman, 2014, Best Poster Award in the MEMS Alliance Georgetown University, Washington DC, USA, 2009, and the Cray Award for the best-published paper in Microtechnology/Microsystem technology, Braunschweig, Germany, 2007.

EDUCATION**Habilitation**, Microfluidics Jan. 2013

Technische Universität Braunschweig, Germany

Dissertation: Electromagnetically Driven Micropumps for Life Science Applications

Scientific Lecture: Micro energy harvesting and its applications

Ph.D., Mechanical Engineering Jun. 2007

University of Jordan, Amman

Dissertation: Numerical Simulation of the Flow Field in a Spiral Micropump

M.Sc. in Mechanical Engineering Aug. 2001

University of Jordan, Amman

Thesis: Two-Phase Flow Pressure Drop in a T-Junction

B.Sc. in Mechanical Engineering Mar. 1999

Mu'tah University, Jordan

PROFESSIONAL EXPERIENCES**President** Aug. 2021 – Present

German Jordanian University, Amman, Jordan

President Sept. 2020 – Aug. 2021

Middle East University, Amman, Jordan

Vice President for Scientific Faculties Sept. 2019 – Sept. 2020

Middle East University, Amman, Jordan

Professor Feb. 2017 – Present

Mechatronics Engineering Department

School of Applied Technical Sciences, German Jordanian University, Jordan

Guest Researcher and Privat Dozent (PD) 2013 – Present

Institute of Microtechnology (IMT)

Technische Universität Braunschweig, Braunschweig, Germany

Dean Mar. 2019 – Sept. 2019

School of Applied Humanities and languages, German Jordanian University, Jordan

Dean Mar. 2016 – Feb. 2018

School of Applied Technical Sciences, German Jordanian University, Jordan

Associate Professor Feb. 2013 – Feb. 2017

Mechatronics Engineering Department

School of Applied Technical Sciences, German Jordanian University, Jordan

Exchange Coordinator Nov. 2013 – Mar. 2016

Mechanical Engineering Department

School of Applied Technical Sciences, German Jordanian University, Jordan

Visiting Scholar Jul. – Sept. 2014

Research Laboratory of Electronics, Micro/Nanofluidic BioMEMS Group

Massachusetts Institute of Technology (MIT), USA

Research Associate, Group leader and Lecturer Jun. 2007 – Feb. 2013

Institute of Microtechnology (IMT),

Technical University Braunschweig, Braunschweig, Germany

Research Assistant (DAAD Scholarship) Oct. 2005 – May 2007

Institute of Microtechnology (IMT),

Technical University Braunschweig, Braunschweig, Germany

PUBLICATIONS**Articles in refereed Journals**

1. Al-Halhouli, A. T., Al-Ghussain, L., Khallouf O., Rabadi A., Alawadi J., Liu H., Al Oweidat K., Chen F., Zheng D. (2021) Clinical Evaluation of Respiratory Rate Measurements on COPD (Male) Patients Using Wearable Inkjet-Printed Sensor. *Sensors*, 21, 468.
2. Al-Halhouli, A. T., Albagdady, A., Alawadi, J., Abu Abeeleh M. (2021) Monitoring Symptoms of Infectious Diseases: Perspectives for Printed Wearable Sensors. *Micromachines*, 12, 620.
3. Abu-Khalaf, J., Al-Ghussain, L., Nadi, A., Al-Halhouli, A. T. (2020) Conductivity and Stretchability of Inkjet-Printed Silver Nanoparticle Patterns: Effect of the Number of Printed Layers, *International Journal of Mechanical Engineering and Robotics Research*, 9 (4), 528-534.
4. Al-Halhouli, A. T., Doofesh, Z., Albagdady, A., Dietzel (2020) A. High-Efficiency Small Sample Microparticle Fractionation on a Femtosecond Laser-Machined Microfluidic Disc. *Micromachines*, 11, 151. <https://doi.org/10.3390/mi11020151>
5. Al-Halhouli, A. T., Al-Ghussain, L., El Bouri, S., Habash, F., Liu, H., Zheng, D. (2020) Clinical Evaluation of Stretchable and Wearable Inkjet-Printed Strain Gauge Sensor For Respiratory Rate Monitoring At Different Measurements Locations, *Journal of Clinical Monitoring and Computing*, <https://doi.org/10.1007/s10877-020-00481-3>.
6. Al-Halhouli A. T., Bahaa Elfar, Al-Faqheri W (2020) Development of Active Centrifugal Pump for Microfluidic CD Platforms. *Micromachines*. 11, 140.
7. Al-Halhouli, A. T., Al-Ghussain, L., El Bouri, S., Habash, F., Liu, H., Zheng, D. (2020) Clinical Evaluation of Stretchable and Wearable Inkjet-Printed Strain Gauge Sensor for Respiratory Rate Monitoring at Different Body Postures. *Applied Sciences*, 10, 480.
8. Al-Halhouli A. T., Albagdady A., Dietzel A (2019) Sheath-less High Throughput Inertial Separation of Small Microparticles in Spiral Microchannels with Trapezoidal Cross-Section, submitted, *RSC Adv.*, 9, 41970-41976
9. Al-Halhouli A. T., Al-Ghussain L., El Bouri S., Liu H., Zheng D (2019) Fabrication and Evaluation of a Novel Non-Invasive Stretchable and Wearable Respiratory Rate Sensor Based on Silver Nanoparticles Using Inkjet Printing Technology. *Polymers*, 11, 1518.
10. Al-Halhouli A. T., Albagdady A., Al-Faqheri W., Kottmeier J., Meinen S., Frey L. J., Krull R., Dietzel A. (2019) Enhanced inertial focusing of microparticles and cells by integrating trapezoidal microchambers in spiral microfluidic channels. *RSC Adv.*, 9, 19197-19204.
11. Abu-Khalaf, J., Al-Ghussain, L., Nadi, A., Saraireh, R., Rabayah, A., Altarazi, S., Al-Halhouli, A. T. (2019) Optimization of Geometry Parameters of Inkjet-Printed Silver Nanoparticle Traces on PDMS Substrates Using Response Surface Methodology. *Materials*, 12, 3329.
12. Albarahmieh E., Abu Ammouneh L., Kaddoura Z., Abu Hantash F., Alkhalidi B. A., Al-Halhouli A. T. (2019) Fabrication of Dissolvable Microneedle Patches Using an Innovative Laser-Cut Mould Design to Shortlist Potentially Transungual Delivery Systems: In Vitro Evaluation. *AAPS PharmSciTech*, 20, 215, DOI: 10.1208/s12249-019-1429-5

13. Khanfar M. F., Abu Eishah N. J., Al-Ghussain L., Al-Halhouli A. T. (2019) Lab on a Chip for the Colorimetric Determination of Nitrite in Processed Meat Products in the Jordanian Market, *Micromachines*, 10, 36.
14. Abu-Khalaf, J., Al-Ghussain L., Al-Halhouli, A. T. (2018) Fabrication of Stretchable Circuits on Polydimethylsiloxane (PDMS) Pre-Stretched Substrates by Inkjet Printing Silver Nanoparticles. *Materials*, 26, 11(12), 2377.
15. Abu-Khalaf, J., Saraireh, R., Eisa, S., Al-Halhouli, A. T. (2018) Experimental Characterization of Inkjet-Printed Stretchable Circuits for Wearable Sensor Applications. *Sensors*, 18, 3476.
16. Al-Halhouli A. T., Al Shishani G., Al Baghdadi A., Al-Faqheri W. (2018) New generation of Spinning System For Robust Active Mixing On Microfluidic CDs: Oil/Water Emulsion as an Evaluation Test. *RSC Adv.*, 8, 26619-26625.
17. Al-Halhouli A. T., Al-Faqheri W., Alhamarneh B., Hecht L., Dietzel A. (2018) Spiral Microchannels with Trapezoidal Cross Section Fabricated by Femtosecond Laser Ablation in Glass for the Inertial Separation of Microparticles. *Micromachines*, 2018, 9(4), 171.
18. Al-Halhouli A. T., Qitouqa H., Alashqar A., Abu-Khalaf J. (2018) Inkjet Printing for the Fabrication of Flexible/ Stretchable Wearable Sensors, *Sensor Review*, 38 (4), 438-452, <https://doi.org/10.1108/SR-07-2017-0126>.
19. Khanfar M. F., Al-Faqheri W., Al-Halhouli A. T. (2017) Low Cost Lab on Chip for the Colorimetric Detection of Nitrate in Mineral Water Products, *Sensors*, 17(10), 2345.
20. Al-Faqheri W., Thio T. H. G., Qasaimeh M. A., Dietzel A., Madou M., and Al-Halhouli A. T. (2017) Particle/Cell Separation on Microfluidic Platforms Based-on Centrifugation Effect: A Review. *Journal of Microfluidics and Nanofluidics*, 21:102.
21. Al-Halhouli A. T., Rawashdeh N. A., Sanna M., Büttgenbach S., Dietzel A. (2017) Control, Modeling and Evaluation of a Magnetic Piston Miniature Pump. *Arabian Journal for Science and Engineering*, 42: 4693–4700.
22. Matar M., Al-Halhouli A.T., Dietzel A, Büttgenbach S. (2016) Performance enhancement of the synchronous micropump based on experimental and numerical investigations of the magnetic field flux density in planar microcoils. *Transactions of the Institute of Measurement and Control*, DOI: 10.1177/0142331216661757.
23. Al-Halhouli A. T., Qitouqa H., Malkosh N., Shubbak A., Al-Gharabli S., Hamad E (2016) LEGO Mindstorms NXT for Elderly and Visually Impaired People In-need: A Platform. *Technology and Health Care*, 24(4):579-85.
24. Matar M., Al-Halhouli A.T., Dietzel A, Büttgenbach S. (2016) Microfabricated centrifugal pump driven by an integrated synchronous micromotor, *Microsystem Technologies*, online first, DOI: 10.1007/s00542-016-3069-y.
25. Al-Halhouli A.T., Demming S., Dietzel A., and Büttgenbach S (2016) Design, Fabrication and Characterization of a Constant Flow Micropump System, *Journal of Thermal Science and Engineering Applications*, 8(2), 021006.
26. Musmar S., Al-Halhouli A. T., Tlili I., Büttgenbach S (2015) Performance analysis of a new water based micro-cooling system, *Experimental Heat Transfer*, published online. DOI: 10.1080/08916152.2015.1024353
27. Al-Halhouli A.T., Abu Rumman M., Zgoul M (2015) Design and Testing of a Meso-Scale Pneumatic Actuated Electrical Power Generator. *Int. J. of Thermal & Environmental Engineering*, 10 (1), 63-67.
28. Al-Halhouli A.T., Kloub H. A., Wegner M., Büttgenbach S (2015) Design and Experimental Investigations of Magnetic Energy Harvester at Low Resonance Frequency. *Int. J. of Thermal & Environmental Engineering*, 10 (1), 75-80.

29. Al-Halhouli A.T., ALshare A., Mohsen M., Matar M., Dietzel A. and Büttgenbach S (2015). Passive Micromixers using Interlocking Semi-Circle and Omega Shaped Modules: Experiments and Simulations. *Micromachines*, 6(7), 953-968.
30. Pretor S., Bartels J., Lorenz T., Dahl K., Finke J. H., Peterat G., Krull R., Al-Halhouli A.T., Dietzel A., Büttgenbach S., Behrends S., Reichl S., Müller-Goymann C.C (2014) Cellular uptake of coumarin 6 under microfluidic conditions into HCE-T cells from nanoscale formulations, *Molecular Pharmaceutics*, 12(1), 34-45.
31. Al-Halhouli A.T., Demming S., Alahmad L., Llobera A., and Büttgenbach S (2014) In-Line Photonic Biosensor for Monitoring of Glucose Concentrations, *Sensors*, 14, 15749-15759.
32. Al-Halhouli A. T., Demming S., Waldschik A., and Büttgenbach S (2014) Implementation of synchronous micromotor in developing integrated microfluidic systems, *Micromachines*, *Micromachines*, 5(3), 442-456.
33. Peterat G., Schmolke H., Lorenz T. Llobera A., Rasch D., Al-Halhouli A.T., Dietzel A., Büttgenbach S., Klages C.-P., Krull R (2014) Characterization of Oxygen Transfer in Vertical Micro Bubble Columns for Biotechnological Process Intensification, *Biotechnology and Bioengineering*, 111, 1809-1819
34. Kilani M. I., Al-Widyan M. I. and Al-Halhouli A. T (2013) Analytical and CFD Investigation of the Applicability of a Ferrofluidic Magnetic Micropump for Fluids with Stress-Sensitive Mircroparticles, *Scientific Research and Essays*.8, 754 – 766.
35. Al-Halhouli A. T., Waldschik, A., Phataralaoha, A., Kilani M. I., and Büttgenbach, S (2012). Development and Testing of an Integrated Electromagnetic Micropump Based on Electroplated Coils and Microfabricated Polymer Magnets, *Journal of micromechanics and microengineering*. 22, 065027.
36. Demming S., Peterat G., Llobera A., Schmolke H., Bruns A., Kohlstedt M., A.T. Al-Halhouli, Klages C.-P., Krull R., Büttgenbach S (2012). Vertical microbubble column – A photonic lab-on-chip for cultivation and online analysis of yeast cell cultures, *Biomicrofluidics*, 6, 034106.
37. Kilani M. I., Al-Halhouli A. T. and Büttgenbach, S (2011). Shear Stress Analysis in a Ferrofluidic Magnetic Micropump. *Nanoscale Microscale Thermophysical Engineering*. 15 (1), 1 – 15.
38. Al-Halhouli A.T. and Büttgenbach S (2010). Liquid Flow in Curved Microchannels. *International Journal of Theoretical and Applied Multiscale Mechanics*. 1 (3), 253-265.
39. Al-Halhouli A.T., Hammad M., Abu-Mulaweh H.I., Alhusein M., and Al-Shannak B (2010). Two-Phase Slug Flow Pressure Drop in a Tee-Junction. *International Journal of Fluid Mechanics Research*. 37 (2).
40. Al-Halhouli A.T., Kilani M. I., and Büttgenbach S (2010). Development of a Novel Electromagnetic Pump for Bio-medical Applications. *Sensors and Actuators A*, 162 (2), 172-176.
41. Al-Halhouli A.T (2009). Recent Advances in on-Disk Viscous Micropumps. *Journal of Microelectronics and Electronic Packaging*. 6, 1-9.
42. Kilani M. I., Al-Halhouli A. T., Galambos C., Haik Y. S. and Büttgenbach, S (2009). Development of a Surface Micromachined On-Chip Flat Disk Micropump. *Sensors and Transducers*, 107(8), 64-76.
43. Büttgenbach S., Balck A., Demming S., Lesche C., Michalzik M., and Al-Halhouli A.T (2009). Development of on Chip Devices for Life Science Applications. *International Journal of Engineering*, 3 (2), 148-158.
44. Al-Halhouli A.T., Kilani M. I., Al-Salaymeh A., and Büttgenbach S (2008). The Spiral Channel Viscous Micropump. *Dirasat*, 35 (2), 120-128.

45. Al-Halhouli A.T., Abu-Mulaweh H. I., Hammad M., Alhusein M., and Al-Shannak B (2008). Experimental Apparatus for Measurements of Two-Phase Slug Flow Pressure Drop in a Tee-Junction. *International Journal of Mechanical Engineering Education*, 36 (3), 184-192.
46. Al-Halhouli A.T., Kampen I., Krah T., Büttgenbach S (2008). Nanoindentation Testing of SU-8 Photoresist Mechanical Properties. *Microelectronic Engineering*. 85(5-6), 942-944.
47. Al-Halhouli A.T., Demming S., Feldmann M., Büttgenbach S., Kilani M. I., and Al-Salaymeh A (2008). Performance Characterization of a Miniature Spiral-Channel Viscous Pump, *Sensors and Actuators A*, 142 (1), 256-262.
48. Al-Halhouli A.T., Al-Salaymeh A., Kilani M. I., and Büttgenbach, S (2007). Numerical Investigation of the Effect of Spiral Curvature on the Flow Field in a Spiral-Channel Viscous Micropump, *Microfluidics Nanofluidics*, 3(5), 537-546.
49. Al-Halhouli A.T., Kilani M. I., Al-Salaymeh A., and Büttgenbach S (2007). Investigation of the Influence of Design Parameters on the Flow Performance of Single and Double Disk Viscous Micropumps, *Microsystem Technologies*, 13 (7), 677-687.
50. Al-Halhouli A.T., Kilani M. I., Al-Salaymeh A., and Büttgenbach S (2006). Influence of Geometrical Design Parameters on the Flow Performance of a Spiral Channel Viscous Micropump, *WSEAS Transactions on Fluid Mechanics*, 1 (6), 601-606.
51. Kilani M.I., Al-Salaymeh A., and Al-Halhouli A.T (2006). Effect of Channel Aspect Ratio on the Flow Performance of a Spiral-Channel Viscous Micropump, *Journal of Fluids Engineering, Transactions of the ASME*, 128 (3), 618-627.

Conferences papers

1. Al-Halhouli A. T., Al-Aloul H., Deeb O., Al-Faqheri W. (2017) Rapid and Reproducible Method to Fabricate Micro-Sized Ferromagnetic Robots for Microfluidic Applications, The 21st International Conference on Miniaturized Systems for Chemistry and Life Sciences (μ TAS 2017), Savannah, Georgia, USA.
2. Al-Faqheri W., Al Shishani G., Al Baghdadi A., Al-Halhouli A. T. (2017) Novel Dual-Motor Spinning System For Active Applications On Microfluidic Compact Discs, The 21st International Conference on Miniaturized Systems for Chemistry and Life Sciences (μ TAS 2017), Savannah, Georgia, USA.
3. Al-Halhouli A. T., Al-Faqheri W., Alhamarneh B., Hecht L., Dietzel A. (2017) Trapezoidal Spiral Microfluidics for Inertial Focusing and Separation of Different Particle Sizes, Symposium on Pharmaceutical Engineering Research- SPhERe, Braunschweig/Germany
4. Albarahmieh E., Al Fakhri W., Abu Ammouneh L., Abu Hantash F., Kaddoura Z., Al-Halhouli A. T. (2017) Employing Innovative Microneedle Patch to Conquer Transungular Drug Delivery Challenge, Symposium on Pharmaceutical Engineering Research- SPhERe, Braunschweig/Germany
5. Al-Halhouli A. T., Rawashdeh N. A., Sanna M., Büttgenbach S., Dietzel A. (2015) Development of a Novel Electromagnetic Double Action Meso-scale Pump, The 16th International Conference on Research and Education in Mechatronics REM2015, Bochum, Germany.
6. Al-Halhouli A. T., Düring L., Alahmad L., Demming S., Llobera A., Dietzel A., Büttgenbach S. (2015) Fabrication and Testing of a photonic Ethanol Biosensor, The 16th International Conference on Research and Education in Mechatronics REM2015, Bochum, Germany.

7. Lorenz T., Al-Halhouli A.T., Mohsen M., Matar M., Büttgenbach S and Dietzel A. (2013) Untersuchung und Entwicklung passiver Mikromischer für einen großen Bereich geringer Reynolds-Zahlen, *Mikrosystemtechnik-Kongress 2013*, Aachen, Germany.
8. Büttgenbach S., Al-Halhouli A.T., Feldmann M., Seidemann V., Waldschik A (2013) Electromagnetic Microactuators, *Smart Sensors, Actuators, and MEMS VI*, Grenoble, France.
9. Munoz-Berbel X., Rodriguez-Rodriguez R., Demming S., Al-Halhouli A.T., Büttgenbach S., Verpoorte E., Ortiz P., Llobera A (2012). Biophotonic lab on a chip with integrated size-exclusion microfilters for cell proliferation monitoring. The Sixteenth International Conference on Miniaturized Systems for Chemistry and Life Sciences (μ TAS 2012), Okinawa, Japan.
10. Peterat G., Demming S., Schmolke H., Al-Halhouli A.T., Edlich A., Büttgenbach S., Klages C.-P., and Krull R. (2012) Multiphase Microbioreactors: Scaling Down Hydrodynamic Principles for Biological Process Intensification. *Microfluidics Conference*, Heidelberg, Germany.
11. Al-Halhouli A.T., Waldschik A., Kilani M. I., and Büttgenbach S. (2012) The Electromagnetic Driven Gentle Micropump, *ICTEA12*, Istanbul, Turkey.
12. Al-Halhouli A.T., Demming S., Alahmad L., Llobera A., and Büttgenbach S. (2011) Fabrication and Testing of an Optical Enzymatic Glucose Biosensor Based on External Immobilization on Micro-beads. *International Conference on Bio-Sensing Technology 2011*, Amsterdam, Netherlands.
13. Al-Halhouli A.T., Waldschik A., Kilani M. I., and Büttgenbach S. (2011) A Multifunction Pump Based on Microfabricated Electromagnetic Actuator, *Mikrosystemtechnik-Kongress 2011*, Darmstadt, Germany, 685-688.
14. Al-Halhouli A.T. and Büttgenbach S. (2010) Numerical Analysis of Mixing in a Multifunction Electromagnetic Micropump, *ICNMM 2010*, Montreal, Canada. FEDSM-ICNMM2010-30971.
15. Al-Halhouli A.T., Waldschik A., Kilani M. I., and Büttgenbach S. (2010) Gentle Micropump Based on Microelectromagnetic Actuator, *Nanotech 2010*, California, USA. 340-343.
16. Al-Halhouli A.T. (2010) Highlights on Microfluidics for Energy Generation. *International Engineering Conf. on Hot Arid Regions*, Saudi Arabia, 2010, 91-94.
17. Al-Halhouli A.T. and Büttgenbach S. (2010) Numerical Visualization of Mixing in a Novel Electromagnetic Pump. *ICTEA10*, Marrakesh.
18. Al-Halhouli A.T. (2010) Analysis on the Effect of Geometrical Design Parameters on Maximum Shear Stresses in an Electromagnetic Micropump. *MOEMS-MEMS 2010*, 7593, San Francisco, California, USA.
19. Al-Halhouli A.T. (2009) Electromagnetic Field Analysis on a Novel Electromagnetic Actuator for Fluid Handling Applications. *PowerMEMS 2009*, Washington DC, USA. 308-311.
20. Al-Halhouli A.T., Kilani M. I., and Büttgenbach S (2009).Development of a Novel Meso-Scale Electromagnetic Pump for Bio-medical Applications. *Procedia Chemistry*, 1(1), 349-352.
21. Demming S., Balck A., Emeis R., Al-Halhouli A.T., and Büttgenbach S. (2009) PDMS Micro Components for Separation of Biomass in Lab-on-a-Chip Applications. *Mikrosystemtechnik Kongress 2009*, Berlin, Germany.
22. Büttgenbach S., Balck A., Demming S., Lesche C., Michalzik M., and Al-Halhouli A.T. (2009) A Survey of Microfluidic Devices Fabrication Technology at the IMT, *ICTEA09*, Abu Dhabi, UAE.

23. Al-Halhouli A.T., and Büttgenbach S (2009) Friction factor and Viscous Heating in Liquid Flows in Curved Microchannels, *ICTEA09*, Abu Dhabi, UAE.
24. Balck A., Al-Halhouli A.T., and Büttgenbach S (2009), Separation of Red Blood Cells in Y-microchannels, *ICTEA09*, Abu Dhabi, UAE.
25. Kilani M.I., Al-Halhouli A.T., Büttgenbach S (2009) Analytical and Numerical Simulations of the Flow Performance of a Ferrofluidic Magnetic Micropump for Particle-Laden Applications, *ICTEA09*, Abu Dhabi, UAE.
26. Al-Halhouli A.T., and Büttgenbach S (2008) Fluid Flow in Curved Rectangular Microchannels, *International Conference on Nanotechnology*, Abu Dhabi, UAE.
27. Al-Halhouli A.T., Kilani M. I., Al-Salaymeh A., and Büttgenbach S (2008) The Spiral Channel Viscous Micropump. *Graduate Studies Research Conference*. Jordan.
28. Al-Halhouli A.T., Kilani M. I., and Büttgenbach S (2008). CFD Simulations of Viscous Heating in a Spiral-Channel Micropump. *Micro/Nanoscale Heat Transfer International Conference*. Tainan, Taiwan.
29. Kilani M. I., Al-Halhouli A.T., Galambos P. C., Al-Salaymeh A (2007). Design and Testing of a Surface Micromachined On-Chip Flat Disk Micropump. *The Sixth Jordanian International Mechanical Engineering Conference*, Jordan.
30. Al-Halhouli A.T., Kampen I., Krah T., Büttgenbach S (2007). Nanoindentation Testing of SU-8 Photoresist Mechanical Properties. *33rd International Conference on Micro- and Nano-Engineering*. Denmark, 61-62.
31. Al-Halhouli A.T., Kilani M. I., and Büttgenbach S (2007) Development and Testing of a Flat Disk Micropump. *18th Workshop on Micromachining, Micromechanics, and Microsystems*. Portugal, 155-158.
32. Amayreh M. I., Al-Salaymeh A., Kilani M. I., and Al-Halhouli A.T. (2007). Numerical Prediction of a Bi-Directional Micro Hot Wire Anemometer Using Three Parallel Wires. *The Third International Conference on Thermal Engineering: Theory and Applications*, Jordan.
33. Al-Halhouli A.T., Demming S., Feldmann M., Büttgenbach S., Kilani M. I., and Al-Salaymeh A (2006). Spiral-Channel Viscous Micropump- Experimental and Numerical Investigations. *Euroensors XX - 2006*, Sweden 38-39.
34. Al-Halhouli A.T., Kilani M. I., Amayreh M., Al-Salaymeh A., and Büttgenbach S (2006). Parametric study of Single Disk Viscous Micropump. *International Conference on Bio-Nanotechnology: Future Prospects in the Emirates*, UAE, 193-197.
35. Kilani M. I., Al-Halhouli A.T., Al-Salaymeh A., and Büttgenbach S (2006). Viscous Pumps-A review. *International Conference on Bio-Nanotechnology: Future Prospects in the Emirates*, UAE, 227-231.
36. Al-Halhouli A.T., Kilani M. I., Al-Salaymeh A., and Büttgenbach S (2006). Effect of mean radius to channel width ratio on the flow performance of Spiral Channel Viscous Micropump. *The 4th WSEAS International Conference on Fluid Mechanics and Aerodynamics*, Greece.
37. Al-Halhouli A.T., Al-Salaymeh A., and Kilani, M. I (2006). Numerical Simulations of the Flow Field in a Viscous Spiral Micropump. *Proceeding of the 2nd International Conference on Thermal Engineering Theory and Applications*, UAE.
38. Al-Halhouli A.T., Alhusein M., Hammad M., and Al-Shannak B. (2005). Two-Phase Slug Flow Pressure Drop in a Tee-Junction, *The First Middle-East International Conference on Advances in Civil, Mechanical and Material Engineering*, Jordan.

TEACHING

- Micro-Electro-Mechanical-Systems (MEMS) 2013 – 2018
- Hydraulic and Pneumatic Systems 2013 – 2018
- Fluid Mechanics 2013 – 2015
- Statics 2013
- Microfluidic Systems (Graduate and undergraduate course) 2009 – 2012

RESEARCH PROJECTS WITH INDUSTRY

- Digital Twin Software to Control Part of Jordanian Electrical Networks with Considering the Cyber-Security Aspect, 2021, funded by the Royal Academy of Engineering, Industry Academia Partnership Programme, UK.

Partners:

- Middle East University (MEU), Jordan, Project leader
- University of Newcastle, Newcastle, U.K
- German Jordanian University (GJU)
- Jordan Electric Power Company (JEPCO)
- Eta-Max company, Jordan
- Alanwa Establishment, Jordan.

£80,000.00 (110,231.20 USD)

- Decarbonising Jordanian Energy Systems Utilising Smart Solutions based on Energy Storage, 2021, funded by the Royal Academy of Engineering, Industry Academia Partnership Programme, UK.

Partners:

- Mutah University, Jordan, Project leader
- Middle East University (MEU), Jordan
- University of Newcastle, Newcastle, U.K
- Tafila University, Jordan
- Cardiff University, Jordan
- Ministry of Energy and Mineral Resources (MEMR)
- National Electric Power Company (JEPCO)
- SEPCO Electric Power Construction Corporation (SEPCO), Jordan
- Sadeem company, Jordan

£80,000.00 (110,231.20 USD)

- COVID-19 Immunoassay test based on Lab on Disc technology, 2020, recently funded by the Industrial Research and Development Fund, Higher Council of Science and Technology, Jordan.

Partner:

- Atlas Medical, Jordan

JD 20,000.00 (70,514 USD)

- Innovative Peer to Peer Electricity Sharing Towards the Development of Smart and Cooperative Microgrids, 2019, funded by the Royal Academy of Engineering, Industry Academia Partnership Programme, UK.

Partners:

- University of Newcastle, Newcastle, U.K
- Eta-Max, Jordan

£50,000.00 (69,481 USD)

- Inkjet-printed Respiratory Rate Wearable Sensors for infants: Towards Remote Monitoring Solutions for Low-setting Villages and Refugee Camps, 2018, funded by the Royal Academy of Engineering, Industry Academia Partnership Programme, UK.
Partners:

 - Anglia Ruskin University, Cambridge, U.K
 - THERAPYAUDIT Limited, UK
 - Atlas Medical, Jordan

£49,267.30 (69,481 USD)
- Development of Nanoemulsion for Psoriasis: establishing a roadmap towards efficient microfluidization preparation technique and inkjet characterization method, 2018, funded by the Royal Academy of Engineering, Industry Academia Partnership Programme, UK.
Partners:

 - University of East Anglia(UEA), U.K
 - The Jordanian Pharmaceutical Manufacturing (JPM), Jordan

£50,000.30 (70,000 USD)
- Development of Novel Dual-Motor Spinning System for Microfluidic Compact Discs - Towards GJU Spin-off, 2018, German Jordanian University.
Partners:

 - Atlas medical, Jordan
 - The Jordanian Pharmaceutical Manufacturing Co.

24,855 JD (35,000 USD)

RESEARCH PROJECTS

- Development and Fabrication of Low-Cost, High-Tech Stretchable and Wearable Cardiac Sensor For Low-Resources Settings, Funded by Alquds Academy for Scientific Research- Applied Research and Innovation Program, 2020.
35,800 JD (50,420 USD)
- Severe Illness Detection for Home-Quarantined COVID-19 Patients Using Wearable Sensors and IoT Technology, 2020, Funded by the Scientific Research and Support Foundation, 2020, Jordan
15,025 JD (21,160 USD)
- Development of Novel Microfluidic-based Platforms for CTCs Isolation from Whole Blood, Seed fund, 2016, German Jordanian University.
30,000 JD (42,250 USD)
- Use of Nano-Particles for Future Energy, Funded to Office of Naval Research Global (ONRG) in collaboration with Masdar University, UAE, 2016.
300,000 USD
- Fabrication and Characterization of Autonomous Microrobots for Cancer Detection and Treatment: Funded by Scientific Research and Support Foundation, 2015, Jordan
15,000 USD
- Inertial focusing for continuous nanoparticles separation in femtosecond laser 3D micromachined curved channels: Funded by German Exchange and Academic Services, 2015, Germany
238,010 EUR (269,150 USD)

- Developing and Fabrication of Capacitive Micro Electromechanical System (MEMS) Interactive DC\AC Power Inverter for Renewable Energy Applications: Funded by Scientific Research and Support Foundation, 2015, Jordan
49,000 JD (69,200 USD)
- Improving Thermal Efficiency of Industrial Plants via Conversion of Waste Heat to Electricity in collaboration with University of Jordan: Funded by Scientific Research and Support Foundation, 2015, Jordan
92,000 JD (130,000 USD)
- Utilization of Lab on a Chip Technology for the Colorimetric Determination of Chemical Compounds: Funded by Abdul Hameed Shoman Foundation. 2015, Jordan
15,000 JD (21,180 USD)
- The Design and Development of Wearable Stretchable Pulse Oximeter Biosensors Using a Novel Printing technology of conductive Nanoparticles for Physiological Monitoring: Funded by Scientific Research and Support Foundation, 2014, Jordan
181,300 JD (255,000 USD)
- Microsystems for particulate life-science products: Funded by the German Research Foundation (DFG) in the framework of the Collaborative Research Group mikroPART FOR856, 2011 - 2014.
- Development of an Integrated Electromagnetic Micropump for Biomedical Applications. Funded by German Research Foundation (DFG) within the framework of the Research Grant BU 340/28-1, 2007 – 2011.
- Numerical Simulation of the Flow Field in a Spiral Micropump. Funded by German Exchange Office (DAAD), 2005 – 2007.

EUROPEAN PROJECTS (ERASMUS+)

- Advanced Teaching and training on Smart grid and Grid Integration of Renewable Energy Systems (At-SGIREs). Project No. 585648-EPP-1-2017-1-UK-EPPKA2-CBHE-JP.
Grant holder: University of Newcastle, UK
Partners: UK, Germany, Cyprus, Morocco, Syria, Jordan
Value: ~ 1,000,000 EUR (One Million Euros)
- Development of Environmental Engineering Courses and Injection of Climate Change Concept For Undergraduate Curriculum, Project Number: 573927-EPP-1-2016-1-JO-EPPKA2-CBHE-JP.
Grant holder: University of Jordan, Jordan
Partners: Portugal, Germany, Syria, Jordan
Value: ~ 1,000,000 EUR (One Million Euros)
- Development of higher Education teaching modules on Socio-economic impacts of the Renewable Energy Implementation. Project No. 561638-EPP-1-2015-1-JO-EPPKA2-CBHE-JP.
Grant holder: German Jordanian University, Jordan
Partners: Germany, Cyprus, Italia, Syria, Egypt, Jordan
Value: ~ 1,000,000 EUR (One Million Euros)

INVITED TALKS

- **Recent Advances in Microfluidics at the NanoLab – German Jordanian University (GJU)**, 1st NYU Biomedical & Biosystems Conference, April 9 – 11, 2017, Abu Dhabi, UAE.
- **Microfluidic Devices for Biomedical Applications**, American University in Cairo (AUC), Feb. 14, 2016
- **Microfluidic Systems for Life Science Applications**, 13th International Conference on Fluid Control, Measurements and Visualization (FLUCOME 2015), November 15 -18, 2015, Qatar University, Doha, Qatar
- **Toward Programmable Manipulation of Liquids in Microfluidic Platforms**, European Lab Automation, Nano & Microfluidics Track, June 6–7, 2013, Hamburg, Germany
- **Toward Programmable Microfluidic Platforms for Biotechnological Screening**, Micro Flow Chemistry and Biology Workshop, Nov. 7-8, 2012, Dead Sea, Jordan
- **Microfluidic Systems for Sensing and Synthesis**, Sino-German Symposium: Frontier Research On Smart Nanodevices, Sep. 27 2012, Braunschweig, Germany
- **Lab-on-a-Chip for Sensing and Synthesis**, 6th Sino-German Symposium on Micro- and Nano-Production, Measurement and Application, June 20, 2012, Braunschweig, Germany

SCHOLARSHIPS, AWARDS AND GRANTS

- **German Academic Exchange Service (DAAD) grant** to conduct a research visit to the Institute of Microtechnology, TU Braunschweig, Germany, Jul. – Sept. 2016.
- **German Research Foundation (DFG) grant** to conduct a research visit to the Institute of Microtechnology, TU Braunschweig, Germany, Jul. – Sept. 2015.
- **Arab-American Frontiers Fellowship**, National Research Council, USA to visit the Nano Lab at Tufts University, June 2015.
- **Office of Naval Research Global (ONRG) grant Award**, Collaborative Support program (CSP) to **support** organizing the International Conference of Young Scientists on Innovative Applied Renewable Energy Researches (ICYS- ARE 2015) being held on May 18 – 21, 2015 at the German-Jordanian University, Jordan.
- **German Jordanian University (GJU) Distinguished Researcher Award**, Amman, Jordan, Nov. 2014
- **Office of Naval Research Global (ONRG) grant Award** to conduct a summer research visit at the Micro/Nanofluidic BioMEMS group, Massachusetts Institute of Technology (MIT), USA. Cambridge MA, Jul. – Sep. 2014.
- **Grant** to participate in the Arab-American Frontiers of Science, Engineering, and Medicine symposium, Oman, Dec. 2014.
- **Scholarship** to participate in the Regrid Advanced Online Training, run by the Renewables Academy AG as commissioned by the Ministry for the Environment, Nature Conservation and Nuclear Safety, Feb. 2014.
- **Grant** to attend the Researchers Ethics and Commercialization Workshop organized by the Bibliotheca Alexandrina, Center for Special Studies and Programs (CSSP), in collaboration with the Arab Regional Office for The World Academy of Sciences for

the Advancement of Science in Developing Countries (TWAS-ARO), November 2013.

- The **Best Poster Award** in the MEMS Alliance Georgetown University, Washington DC, USA, 2009.
- The **Best Paper Award** in the First Graduate Studies Research Conference, Amman, Jordan, 2008.
- The **Cray Award** for the best published paper in Microtechnology/Microsystem technology, Braunschweig, Germany, 2007.
- **DAAD Scholarship** (Sandwich Program) for attending 4 Months German language course at Goethe-Institute/Mannheim and conducting the Ph.D. dissertation work at the Institute for Microtechnology/ Technical University Braunschweig, Germany, 2005 – 2007.
- Division of Fluid Dynamics (DFD) of **The American Physical Society (APS) Grant** for attending the 59th Annual Meeting of the Division of Fluid Dynamics, Tampa Bay, Florida, 2006.

PROFESSIONAL SERVICES

Member of the Industrial Scientific Research and Development Fund Council, Higher Council for Science and Technology, Nov. 2019 – present.

Member of the Industrial Scientific Research and Development Fund Council, Higher Council for Science and Technology, Jan. – Mar. 2018.

Member of appointment and promotion committee, GJU

Member of students' affairs committee, GJU

Member of University council, GJU

Member of research council, GJU

Member of Middle East University (MEU) research council, Jordan

Member of the DAAD pre-selection commission for the DAAD PhD scholarships in Jordan, Sept. 2015.

Member of the DAAD selection commission for the "New Perspectives for Young Syrians and Jordanians" MA scholarships. April 2015.

Manuscripts reviewer for: Microfluidics Nanofluidics, International Journal of Mechanical Engineering Education, International Journal of Applied Electromagnetics Mechanics, International Journal of Engineering, Energy conversion and management, Sensors & Actuators A, Sensors & Actuators B.

Organizer and chair of the International Conference of Young Scientists on Innovative Applied Renewable Energy Researches (ICYS- ARE 2015) being held on May 18 – 20, 2015 at the German-Jordanian University, Jordan

Organizer of the workshop: “Brain-Drain” to “Brain-Gain”: Challenges and Opportunities. May 20th, 2015, Evason Ma'In Hot Springs, Jordan.

Organizer and Scientific Committee Member of the Microfluidics/Nanofluidics and Life Science Applications session

- International Conference in Thermal Engineering (ICTEA09), Abu Dhabi, 2009.

- International Conference in Thermal Engineering (ICTEA10), Marrakesh, 2010.
- International Conference in Thermal Engineering (ICTEA12), Istanbul, 2012.

Member of the international program committee of the International Conference on Sensors Engineering and Electronics Instrumental Advances, Dubai, UAE, 2015.
(http://www.sensorsportal.com/HTML/CONFERENCES/SEIA_2015/Committees.htm)

Member of the Editorial Board of the "Journal of Advanced Thermal Science Research"

Leader of the GYA group: Young Scientists Mobility and Migration: Action Against the Brain Drain (2013 – 2015)

LANGUAGES

Arabic, English and German.

REFERENCES

Prof. Dr. Andreas Dietzel

Head of the Institute of Microtechnology (IMT), Technische Universität Braunschweig
Alte Salzdahlumer Str. 203, 38126 Braunschweig, Germany

Tel.: +49-531-3919750

E-Mail: a.dietzel@tu-bs.de

Prof. Dr. Stephanus Büttgenbach

Institute of Microtechnology (IMT), Technische Universität Braunschweig
Alte Salzdahlumer Str. 203, 38126 Braunschweig, Germany

Tel.: +49-531-3919724

E-Mail: s.buettgenbach@tu-bs.de

Prof. Jongyoon Han

Electrical Engineering and Biological Engineering Departments
Micro/Nanofluidic BioMEMS Group/ Research Laboratory of Electronics (RLE)
Massachusetts Institute of Technology (MIT), USA

Lab Website: rle.mit.edu/micronano

Tel.: +1-617- 253-2290

E-Mail: jyhan@mit.edu