

# Nidal Alshwawreh, PhD

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## BACKGROUND

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Dr. Alshwawreh has more than 8 years hands-on experience in materials science and applications in research and academic settings. He joined the Industrial Engineering Department at the German Jordanian University (GJU) in October 2014, where he is currently **the Dean of Innovation, Technology Transfer and Entrepreneurship**. In addition, he also responsible as the **Director of Consultation and Training Center** at GJU. He served as the **Department Chair** from 2016 to 2018. In addition, he was appointed as **Vice Dean for Scientific Research** at GJU (2 years). Between 2012 and 2014, he was with the Advanced Materials and Process Engineering Laboratory at the **University of British Columbia** (UBC) in Canada working as a **Postdoctoral Research Fellow** to develop advanced solutions for oil and gas, consultation, and energy businesses. Dr. Alshwawreh received his **Ph.D. in Materials Engineering** from the University of British Columbia (UBC). He also holds an MS in Materials Science and Engineering and BS in Electrical Engineering from the United Arab Emirates University (UAEU). He is certified from **Stanford University** in energy innovation and emerging technologies. His research interests are interdisciplinary and include microfabrication, additive manufacturing, non-destructive testing, materials characterization using techniques like SEM, XRD, EBSD, and resistivity probing.

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## EDUCATION

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### **Ph.D. Materials Engineering, 5/2012**

*University of British Columbia - Vancouver, Canada*

Dissertation: "Microstructure Evolution in Electrodeposited Copper"

### **M.S. Materials Science and Engineering, 12/2006**

*United Arab Emirates University- Al Ain, U.A.E*

Thesis: "Fabrication of Array Microstructures by Localized Electrodeposition"

### **B.S. Electrical Engineering, 1/2000**

*United Arab Emirates University- Al Ain, U.A.E*

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## WORK EXPERIENCE

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### **Dean of Innovation, Technology Transfer and Entrepreneurship      10/2021 –Current**

*German Jordanian University – Jordan*

- Developed programs to promote innovation culture on campus (e.g., Innovation Ambassador program)
- Established an incubator to provide start-up services to students and staff
- Supervised projects with donors and funding agencies including GIZ and Orange

(e.g., Dual Study program)

- Managed a team to promote entrepreneurship and career services (career counselling)
- Expanded innovation lab (maker space) facility to support entrepreneurs and students
- Initiated collaboration with national and international partners (e.g., summer school on innovation, entrepreneurship education with DAAD)
- Invited entrepreneurs and experts to participate in entrepreneurship bootcamps and activities
- Acted as the director for Consultations and Training Center
- Supported student-based clubs (e.g., sustainability club, innovation club)
- Arrange for events to promote innovation among faculty and researcher (Falling Walls Lab with DAAD)
- Participated in updating entrepreneurship curricula on campus (social entrepreneurship course with Injaz)
- Supervise projects and provide consultations to local and international organizations

**Director of Consultations and Training Center**

**01/2023 –Current**

*German Jordanian University – Jordan*

- Managed training and consultations activities conducted inside and outside the university
- Coordinated with partners to coordinate training workshops and programs
- Supported externally funded vocational training projects
- Restructured the procedures and operations at the center to increase efficiency and competitiveness
- Prepared proposals to attract funding for specialized training programs

**Dean Assistant for Industrial Relations – Dual Study Coordinator, 09/2020 – Current**

*German Jordanian University – Jordan*

- Lead the implementation of an innovative Dual Study program (combining theoretical knowledge with practical experience for engineering students)
- Reach out to potential industrial partners, prepare MOUs, and coordinate training opportunities
- Follow-up site training, review industrial training reports, and manage training challenges
- Prepare trainees for training, mobilize resources, and supervise technical staff
- Coordinate with international funding agencies, prepare online information sessions, and coordinate meetings with industrial partners and chambers
- Review training plans for students who are spending one year in Germany

**Industrial Engineering Assistant Professor****10/2014 –Current***German Jordanian University – Dept. of Industrial Eng., Amman, Jordan*

- Designed courses in sustainability, energy management, digital manufacturing, advanced materials, engineering economics, instrumentation and Measurements
- Supervised projects with industrial partners in Germany and Jordan (Proctor & Gamble, Triumph International, AHT Automation, Gulf Cables)
- Participated in updating laboratories and expanding department's facilities
- Established digital micro fabrication research laboratory
- Visited academic and research institutes (1-2 months) including Koblenz University of Applied Science, Koblenz, Germany (Aug.-Sept. 2019), Institute of Complex Materials, IFW Dresden, Germany (Jul.-Sept. 2016), National Cheng- Kung University, Taiwan (Jul.-Aug. 2015)

**Vice Dean, Graduate Studies & Scientific Research****8/2017–9/2019***German Jordanian University – Deanship of Graduate Studies and Scientific Research, Amman, Jordan*

- Prepared and administered university-scale research and training budget (approx. US\$1.2 million)
- Reviewed regulations and policies to promote graduate studies and research
- Approved research proposals, reviewed progress reports, and coordinated hiring of research personnel
- Assisted in administering scholarships and participating in attracting national and international funding
- Provided consultation services to around 500 students from various graduate programs
- Liaised with the concerned parties to create a healthy environment for researchers in campus
- Coordinated admission and graduation procedures for post-graduate programs
- Helped in establishing new graduate programs (examples: Master program in Social Work and Refugees, Master program in Engineering Management)
- Represented the Deanship in official meetings with national and international parties

**Industrial Engineering Department Chair****9/2016 –2/2018***German Jordanian University – Dept. of Industrial Eng., Amman, Jordan*

- Led a team of 400 students, professors, industrial lecturers, engineers, and technicians
- Expanded laboratories and workshop facilities
- Hired academic and technical staff in areas like operation research and supply chain management
- Prepared yearly budget, analyzed employee performance, and developed

guidelines and procedures

- Provided consultation to freshmen and senior students in industrial engineering department
- Promoted the department as a model for applied learning
- Established a new chapter for the Institute of Industrial and Systems Engineering (IISE) in campus
- Assisted in organizing workshops, field trips, and technical seminars
- Supported the initiation of a new master program in Engineering Management

**Sessional Lecturer**

**1/2014 – 4/2014**

*Department of Materials Engineering. – University of British Columbia, Vancouver, Canada*

- Taught undergraduate and graduate engineering courses including: Microstructure Engineering, Phase Transformations, Microstructure Evolution of Deformed Materials
- Developed and updated course materials
- Provided tutorials sessions to students to emphasize concepts
- Supervised teaching assistant and students' projects

**Postdoctoral Research Fellow**

**6/2012 – 12/2013**

*University of British Columbia, Dept. of Materials Engineering*

- Studied microstructure evolution processes in electronic materials
- Characterized the optical properties of oxide thin films using spectroscopic ellipsometry (CdZnTe)
- Analyzed the microstructure of magnetic thin films (Co, Co-Fe, Ni)
- Worked with industrial partners on wide range of research projects (Redlen Technologies, Weir-Jones Group)
- Supervised the research work of graduate students and visiting researchers

**Research Assistant**

**9/2007 – 4/2012**

*University of British Columbia, Dept. of Materials Engineering*

- Characterized the effect of heat treatment on the microstructure evolution in Cu interconnects
- Developed advanced model to simulate microstructure evolution rate in Cu thin films
- Initiated a collaboration with a research group in The National Cheng-Kung University-Taiwan
- Supervised the laboratory work of international visiting researchers

**Laboratory Technician**

**12/2003– 7/2007**

*Etisalat University College, Sharjah, U.A.E.*

- Taught and supervised engineering labs
- Tested, calibrated, and operated advanced engineering systems and

instrumentation

- Participated in research (impulsive noise reduction)
- Participated in workshops and seminars
- Provided technical assistance to students in their projects and assignments

#### **Scientific Assistant**

**09/2001– 12/2003**

*College of Engineering, United Arab Emirates University, Al Ain, U.A.E.*

- Participated in teaching engineering freshmen laboratories and courses including engineering measurements, sensors, control by LabVIEW, and signal conditioning
- Participated in research (microfabrication, pollutants detection, and electric field simulation)
- Participated in arranging seminars and workshops
- Assisted in developing new teaching resources for engineering laboratories
- Acted as a grader for courses like engineering mathematics, engineering fundamentals, and freshmen Labs

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#### **RESEARCH INTERESTS**

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- Microfabrication
- Digital manufacturing and automation
- Materials characterization
- Nondestructive testing
- Sustainability and energy management ATTRACTED

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#### **FUNDING (total about \$US 84,000)**

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- Micromechanical testing of copper micro pillars fabricated by localized electrochemical deposition, Deanship of Scientific Research, German Jordanian University, \$US 4,000
- Development of a Low-Cost 3D printer to Fabricate Micro Structures by Electrochemical Deposition, Scientific Research and Innovation Fund, Ministry of Higher Education, Jordan, \$US 80,000.

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#### **Invited Talks**

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- IFW Dresden, Germany, "Microstructure Evolution in Copper Interconnects and Microfabrication by Localized Electrodeposition", August 2016
- American University of Cairo, Egypt, "Microfabrication by Localized Electrodeposition: Capabilities and Challenges", February 2016
- Qatar University, Qatar, "The Effect of Organic Additives and Electrodeposition Conditions on Microstructure and Resistivity of Copper Interconnects", November 2015
- National Cheng Kung University, Taiwan, "EBSD Characterization of Self-Annealing Process in Copper Interconnects" March 2011

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## ADVISING: BACHELOR GRADUATION PROJECTS

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### *Dept. of Industrial Engineering – German Jordanian University*

- Detection of Operating States during Oxy-Fuel Cutting using Acoustic Emission Measurements (in cooperation with IHT Automation Company, Germany). Students: Qais Alhindawi, 2017
- Analysis of the Mechanical and Electrical Properties of All-Aluminum Alloy Overhead Power Conductors (in cooperation with United Cables Industries Company, Jordan). Students: Amro Hejazin, Lamis Tarif, Lara Rashed, 2017
- Optimization of the Mechanical Properties of Cross-linked Polyethylene Insulators in Power Cables produced in Jordan. Students: Yalдар Souber and Zaid Hajarat, 2017
- Development of an Automated Oxy-Fuel Cutting System, Student: Zaid Mana'a, 2018
- Development of Material Selection Tool using MATLAB. Students: S. Elias, D. Kuza, Z. Halaseh, 2018
- Optimizing Mounting and Assemblies of Optoelectronics Laser Systems (in collaboration with TRUMPF Laser Systems, Germany) Student: Farah Alhaddadin, 2019
- Prediction of the effect of precipitation hardening on the mechanical and electrical properties of Al 6201 rods by in-situ electrical resistivity measurements, Student: Rakan Momani, Qudous Alhaiti, 2019
- Relationship between Mechanical and Electrical Properties of Solution Heat Treated and Artificially-aged 6201 All Aluminum Alloy Power Conductors Manufactured in Jordan. Students: Shadi Barghout, Osama Ayasrah, Shamel Quandour, 2020
- Material Utilization Model of Hygiene products for Proctor and Gamble Home Care Production Line. Student: Noural Diab, 2020
- Design and assembly of microforce sensing system for characterization of 3D printed micro devices using localized electrochemical deposition, students: Marah Almakhamreh, Murad Wahbeh, 2020
- Implementation of UNIDO TEST method in Resource-efficient and cleaner production in SME industries, students Mariam Aldulaimy, Mohammad Owaineh, 2020

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## PROFESSIONAL ACTIVITIES

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- Member, Hiring Committee, GJU, 2019
- Member, Patents Commercialization Committee, GJU, 2019
- Member Graduate Studies Council, GJU, 2018
- Organizing committee member, GJU Research Day, 2017
- Member, German Jordanian University council, GJU, 2016
- Member, Faculty of Applied Technical Sciences council, GJU, 2016
- Member, Graduate Studies Guidelines Formulation Committee, GJU, 2015
- Member, Laboratories Development Committee, GJU, 2015
- Organizing committee member, Workshop on Brain-Drain to Brain-Gain:

Challenges and Opportunities, Ma'in, Jordan, 2015

- Organizing committee member, International conference for young researchers (ICYS), 2015
- Organizing committee member, The International conference on Materials Engineering and Applications, Nha Trang, Vietnam, 2021
- Volunteer, Society Promoting Environmental Conservation (SPEC), Vancouver, Canada, 2014
- Volunteer, Start-up Weekend, Vancouver, Canada, 2013
- Volunteer, Grand Award Judge, INTEL International Science and Engineering Fair, U.S.A, 2012
- Reviewed papers for: Thin Solid Films Journal  
Journal of Electronic Materials Surface and Coating Technologies  
Journal of the Electrochemical Society Electrochemical Society Letters

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## AWARDS

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- Peter Hobson's Prize for the best oral presentation (Surface Canada 2011 Conference), Canada, 2011
- International Graduate Research Mobility Award, University of British Columbia, Canada, 2011
- Emerald and Cy Keyes Fellowship in Materials Science, University of British Columbia, Canada, 2010
- Four-Year Graduate Fellowship, The University of British Columbia, Canada, 2009-2011
- PhD Tuitionship Award, The University of British Columbia, Canada 2007-2011
- Graduate Research Assistantship, The University of British Columbia, Canada, 2007-2011
- H.H. Sheikh Khalifa Bin Zayed Al Nahyan Golden Medal for academic excellence (UAEU), U.A.E., 2007

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## SKILLS

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- Languages: Fluent in written and spoken English and Arabic
- Programming and Software: MATLAB, LabVIEW, Solidworks, OriginLab, Minitab
- Hardware: data acquisition, sensors, scanning electron microscopy, energy dispersive X-ray diffraction, electron backscatter diffraction, X-ray diffraction, atomic force microscopy (AFM), four-point probe, Van der Pauw conductivity method, X-ray fluorescence (XRF), optical microscopy, optical interferometer, spectroscopic ellipsometry, tensile testing, fatigue testing, creep testing, hardness testing, impact energy testing, forging, sand casting, wire drawing, electroplating, water jet cutting, oxy-fuel cutting, CNC machining, and sample preparation

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## PROFESSIONAL & WORKSHOP CERTIFICATES (SELECTED SAMPLES)

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- Tanks and Pipelines Corrosion and Mitigation, NACE International, Amman, Jordan, 2019
- Energy Innovation and Emerging Technologies Certificate, Stanford University, USA, 2014

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#### JOURNAL PAPERS

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1. Electrical Resistivity and Tensile Strength Relationship in Heat-Treated All Aluminum Alloy Wire Conductors, Nidal Alshwawreh, Baider Alhamarneh, Qutaiba Altwarah, Shamel Quandour, Shadi Barghout, Osama Ayasrah, Materials 2021, 14(19), 5738; <https://doi.org/10.3390/ma14195738>
  2. Role of Organic Additives in the Fabrication of Micro Copper Rods by Localized Electrochemical Deposition, N Alshwawreh, O Hussien, and M Khanfar, 2020 IOP Conf. Ser.: Mater. Sci. Eng. 894 012011
  3. Electroless-Deposited Platinum Antennas for Wireless Surface Acoustic Wave Sensors, Erik Brachmann, Marietta Seifert, Niels Neumann, Nidal Alshwawreh, Margitta Uhlemann, Siegfried B Menzel, Jörg Acker, Steven Herold, Volker Hoffmann and Thomas Gemming, Materials, MDPI, 12(7), 1002, 2019
  4. Engineering-based Economical Evaluation of the Retired NiMH Batteries from Electric and Hybrid-Electric Vehicles in Jordan, Ahmad Almuhtady, Hani Muhsen, Anas Atieh, Nidal Alshwawreh, Abdulaziz Kadri, Ali Ruziyeh, 2017 Australian Journal of Basic and Applied Sciences, 11(13) October 2017, 128-138, 2017
  5. N. Alshwawreh, M. Militzer, D. Bizzotto, J.C. Kuo "Accelerated Recrystallization in Electrodeposited Dual-Layer Copper Thin Films", Journal of The Electrochemical Society, Focus Issue on Electrochemical Processing for Interconnects, 160, D3154-D3157, 2013.
  6. N. Alshwawreh, M. Militzer, D. Bizzotto, J.C. Kuo "Resistivity-Microstructure Correlation of Self-Annealed Electrodeposited Copper Thin Films", Microelectronic Engineering, 95, 26-33, 2012
  7. N. Alshwawreh, M. Militzer, D. Bizzotto, "Recrystallization of Electrodeposited Copper Thin Films During Annealing", Journal of Electronic Materials, 39, 11, 2476-2482, 2010
  8. Ra'a Said, Nidal Alshwawreh and Yousef Haik, "Fabrication of Array Microstructures Using Serial and Parallel Localized Electrodeposition", International Journal of Nanoscience, 8, 3, 323-232, 2010
  9. Mohamed A.M.O., Said R.A, Alshwawreh N.K., El-Bassiouni M.Y., "Evaluation of Water Content and Ionic Concentrations of Soils via Frequency Domain Analysis of TDR Waveform", Subsurface Sensing Technologies and Applications, 4, 2, 159-186, 2003
  10. Mohamed A.M.O., Said R.A, Alshwawreh N.K., "Development of a Methodology for Evaluating Subsurface Concentrations of Pollutants using Electrical Polarization Technique" Geotechnical Testing Journal, 25, 2, 157-167, 2002
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## CONFERENCE Presentations

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1. Role of organic additives in the fabrication of micro copper rods by localized electrochemical deposition, N Alshwawreh, O Hussien, M Khanfar, The 3rd International Conference on Materials Engineering and Applications (ICMEA 2020), Ho Chi Minh, Veitnam, January 6-8<sup>th</sup> 2020
2. Engineering-based Economical Evaluation of the Retired NiMH Batteries from Electric and Hybrid-Electric Vehicles in Jordan, Ahmad Almuhtady, Hani Muhsen, Anas Atieh, Nidal Alshwawreh, Abdulaziz Kadri, Ali Ruziyeh, 2017 International Conference on Trends in Mechanical Engineering and Manufacturing, Bangkok, Thailand, September 7<sup>th</sup>-8<sup>th</sup> 2017
3. Nidal Alshwawreh, the effect of organic additives and electrodeposition conditions on microstructure and resistivity of copper interconnects, The 13th International Symposium on Fluid Control, Measurement and Visualization (FLUCOM 2015), Qatar University, Doha, Qatar, November 15<sup>th</sup>-18<sup>th</sup> 2015
4. Wei Wang, Nidal Alshwawreh, Akram Alfantazi, "The Application of Electron Backscatter Diffraction (EBSD) in Investigating the Corrosion Behavior of Metals", NACE International, Northern Area Western Conference 2013, Victoria, Canada, February 11<sup>th</sup>-14<sup>th</sup>, 2013
5. N. Alshwawreh, M. Militzer, D. Bizzotto, "Recrystallization Assessment of Self-Annealed Electrodeposited Copper Thin Films", 23<sup>rd</sup> Canadian Materials Science Conference, University of British Columbia, Kelowna, Canada, June 22<sup>nd</sup> -24<sup>th</sup>, 2011
6. N. Alshwawreh, M. Militzer, D. Bizzotto, J. Kuo, "Recrystallization of Electrodeposited Copper Thin Films", 22<sup>nd</sup> Canadian Conference on Surfaces (Surface Canada 2011), Simon Fraser University, Burnaby, Canada, May 13<sup>th</sup>-16<sup>th</sup>, 2011
7. Nidal Alshwawreh, Matthias Militzer, Dan Bizzotto, "Recrystallization of Electrodeposited Copper-Silver Thin Films" 217<sup>th</sup> Electrochemical Society Meeting, Vancouver, Canada, April 25<sup>th</sup>-30<sup>th</sup>, 2010
8. Araji S., Al-Qutayri M., BelHaj K., Alshwawreh N., "Impulsive Noise Reduction Techniques Based on Rate of Occurrence Estimation" Int. Symposium on Signal Processing and its Applications 2007 (ISSPA 2007), Sharjah, UAE, February 12<sup>th</sup>-15<sup>th</sup>, 2007
9. Nidal Alshwawreh, R. A. Said, Yousef Haik, "Fabrication of Array Microstructures by Localized Electrodeposition", International conference in Bio-nanotechnology, UAE, November 18<sup>th</sup>-21<sup>st</sup>, 2006
10. Mohamed A.M.O., Said R.A, Alshawawreh N., "Subsurface Sensing of Pollutants Via a Newly Developed TDR Probe" Proceeding of the 3<sup>rd</sup> Annual Research Conference at the UAE University, April 30<sup>th</sup>-May 1<sup>st</sup>, Alain, UAE, D43-D46, 2002
11. AMO Mohamed, RA Said, N Alshawawreh, "A TDR System for Subsurface Pollutants

Detection (I): Design and Modeling”, TDR Symposium, Northwestern University, USA, September 5<sup>th</sup>-7<sup>th</sup>, 2001

12. AMO Mohamed, RA Said, N Alshawawreh, “A TDR System for Subsurface Pollutants Detection (II): Application and Analysis”, TDR Symposium, Northwestern University, USA, September 5<sup>th</sup>-7<sup>th</sup>, 2001

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#### POSTERS

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1. N. Alshawawreh, M. Militzer and D. Bizzotto, “Recrystallization in Electrodeposited Dual- Layer Copper Thin Films”, 18<sup>th</sup> annual meeting of Pacific Centre for Advanced Materials and Microstructures (PCAMM), Burnaby, Canada, December 7<sup>th</sup>, 2013
2. N. Alshawawreh, M. Militzer and D. Bizzotto, “Microstructure Evolution in Electrodeposited Copper Thin Films for Advanced Microelectronic Applications”, 17<sup>th</sup> annual meeting of Pacific Centre for Advanced Materials and Microstructures (PCAMM), Burnaby, Canada, December 8<sup>th</sup>, 2012
3. N. Alshawawreh, M. Militzer and D. Bizzotto, “Recrystallization of Electrodeposited Copper Thin Films”, Electrochemical Society Canadian Section Spring Symposium, Simon Fraser University, Burnaby, Canada, April 24<sup>th</sup>, 2010
4. N. Alshawawreh, M. Militzer and D. Bizzotto, “Microstructure Evolution in Copper Interconnects”, 15<sup>th</sup> annual meeting of Pacific Centre for Advanced Materials and Microstructures (PCAMM), Vancouver, Canada, December 11<sup>th</sup>, 2010