
SUMMARY OF QUALIFICATIONS

- Interdisciplinary scientist specialized in advanced materials characterization, microfabrication, and electronic materials
- Stanford University-certified in the area of renewable energy and innovative technologies
- Strong believer in applied learning, proactive, and dedicated researcher with experience in coordinating projects between academia and industry
- Extensive teaching and research experience in the University of British Columbia, United Arab Emirates University, and German Jordanian University
- Forward-looking, goal-oriented, problem solver, with strong experience in laboratory management and supervising technical staff, undergraduate and graduate students
- Member of the German Jordanian University's Council
- Interested in energy resources, materials recycling, environmental conservation, additive manufacturing techniques

EXPERINECE

Assistant Professor, Industrial Engineering Dept., German-Jordanian University Oct. 2014-Current

Started a microfabrication and nanofabrication research line

Initiated an international research collaboration with scientists in Canada, Taiwan, and Qatar

Redesigned courses and laboratories to emphasize applied learning

Participated in arranging international conference and meetings to attract scientists and researchers

Examples: 2015 ICYS Renewable Energy Conference

Taught undergraduate engineering courses

Examples: Materials Science, Engineering Economics, Measurements and Instrumentation

Visiting Scientist, Materials Eng. Dept., National Cheng-Kung University, Taiwan Jul. 2015-Aug. 2015

Designed and assembled a thin film deposition system

Characterized the microstructure of copper thin films during recrystallization process

Supervised the research work of an undergraduate student

Arranged for long-term research collaboration

- Technical Consultant**, RTMC Technical Consulting, Canada, Jan. 2014-Oct. 2014
- Worked with industrial partners (Redlen Technologies, Weir-Jones Group)
 - Performed tests, analyzed data, and prepared technical reports
 - Interacted with local industry in various meetings and workshops
- Lecturer**, Materials Eng. Dept., University of British Columbia, Canada, Jan. 2014-Apr. 2014
- Taught undergraduate and graduate engineering courses including:
 - Undergraduate level courses: Microstructure Engineering, Phase Transformations
 - Graduate level courses: Microstructure Evolution of Deformed Materials
- Postdoctoral Research Fellow**, University of British Columbia, Canada Jun. 2012-Dec. 2013
- Studied microstructure evolution processes in electrodeposited copper thin films (BEOL)
 - Characterized the optical properties of oxide thin films using spectroscopic ellipsometry (CdZnTe)
 - Studied the microstructure of nanoscale electrodeposited magnetic thin films (Co, Co-Fe, Ni)
 - Optimized the nickel electrodeposition process for sensors applications (electroforming)
 - Published research outcome in technical journals and scientific conferences
 - Supervised the technical work of PhD students and visiting researchers
- Research Assistant**, University of British Columbia, Vancouver, Canada Sept. 2007-Apr. 2012
- 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
 - Prepared thin films in a Clean Room environment
 - Studied the influence of co-deposition on microstructure evolution in Cu-Ag 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 Engineer**, Etislat University College, Sharjah, U.A.E Dec. 2003-Jul. 2007
- Taught and supervised engineering labs
 - Provided technical assistance to students projects
 - Tested, calibrated, and operated advanced engineering systems and instrumentation
 - Participated in research (impulsive noise reduction)
- Scientific Assistant**, United Arab Emirates University, U.A.E Sept. 2001-Nov. 2003
- Participated in teaching engineering freshmen laboratory
 - Topics covered: engineering measurements, sensors, control by LabVIEW, and signal conditioning

Participated in research (microfabrication, pollutants detection, and electric field simulation)

EDUCATION

Doctor of Philosophy in Materials Engineering 2012
University of British Columbia, Vancouver, Canada
Dissertation: Microstructure Evolution in Electrodeposited Copper Thin Films for Advanced Microelectronic Applications
Supervisors: Prof. Matthias Militzer and Prof. Dan Bizzotto

Master in Materials Science and Engineering 2007
United Arab Emirates University, Al Ain, U.A.E
Thesis: Fabrication of Array Structures by Localized Electrodeposition Technique
Supervisors: Dr. Ra'ad Said and Prof. Yousef Haik

Bachelor in Electrical Engineering 2000
United Arab Emirates University, Al Ain, U.A.E

OTHER EDUCATION

Energy Innovation and Emerging Technologies Certificate 2014
Stanford University, USA
Courses include Solar Cells, Planning for a Sustainable Future with Wind, Water and the Sun

AWARDS AND HONORS

Peter Hobson's Prize for the best oral presentation (Surface Canada 2011 Conference), Canada 2011
Faculty of Applied Science Graduate Award, University of British Columbia, 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
A Scholarship from Jordan government to study in U.A.E University, Jordan 1995-2000

TECHNICAL SKILLS

- *Thin Film Characterization Tools:* scanning electron microscopy (SEM), energy dispersive X-ray diffraction (EDX), in-situ electron backscatter diffraction (EBSD), X-ray diffraction (XRD), atomic force microscopy (AFM), Auger electron spectroscopy (AES), four-point probe (4PP), optical microscopy (OM), optical interferometer, spectroscopic ellipsometry
- *Clean Room Research:* physical vapor deposition (PVD), surface profilometer

- *Electrochemical instrumentation*: potentiostat, quartz crystal microbalance, rotating disk electrodes, microelectrodes, electrochemical impedance spectroscopy
- *Failure analysis*: fracture toughness, fatigue failure, hardness, creep, and non-destructive testing
- *Data and Statistical Analysis*: Origin, SigmaPlot
- *Technical Programming*: LabVIEW, MATLAB/SIMULINK, C++, Visual Basic, Microcontrollers, FPGA
- *Computer Skills*: MS Office, AutoCAD, LyX
- *Languages*: English, Arabic

SERVICE

Manuscript Reviewer:

Thin Solid Films Journal, Recent Patents in Nanotechnology Journal, Journal of The Electrochemical Society, Electrochemical Society Letters

Academic Committees:

Examples: German Jordanian University's council, Faculty of Applied Technical Sciences council, academic appointment committee, graduate studies guidelines formulation committee, laboratories development committee, and promotion committee

Organizing Conferences and Events:

Workshop on Brain-Drain to Brain-Gain: Challenges and Opportunities, Ma'in, Jordan	2015
International conference for young researchers (ICYS)	2015

Volunteering Service:

Society Promoting Environmental Conservation (SPEC), Vancouver, Canada	2014
Start-up Weekend, Vancouver, Canada	2013
Grand Award Judge, INTEL International Science and Engineering Fair, U.S.A	2012

LIST OF PUBLICATIONS

Refereed Journals

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

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

N. Alshwawreh, M. Militzer, D. Bizzotto, "Recrystallization of Electrodeposited Copper Thin Films During Annealing", Journal of Electronic Materials, 39, 11, 2476-2482, 2010

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

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

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

Conferences and Symposiums

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 11-14, 2013

N. Alshwawreh, M. Militzer, D. Bizzotto, “Recrystallization Assessment of Self-Annealed Electrodeposited Copper Thin Films”, *23rd Canadian Materials Science Conference*, University of British Columbia, Kelowna, Canada, June 22-24, 2011

N. Alshwawreh, M. Militzer, D. Bizzotto, J. Kuo, “Recrystallization of Electrodeposited Copper Thin Films”, *22nd Canadian Conference on Surfaces (Surface Canada 2011)*, Simon Fraser University, Burnaby, Canada, May 13-16, 2011

Nidal Alshwawreh, Matthias Militzer, Dan Bizzotto, "Recrystallization of Electrodeposited Copper-Silver Thin Films" *217th Electrochemical Society Meeting*, Vancouver, Canada, April 25-30, 2010

Al-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 12-15, 2007

Nidal Alshwawreh, R. A. Said, Yousef Haik, “Fabrication of Array Microstructures by Localized Electrodeposition”, *International conference in Bio-nanotechnology*, Alain, UAE, November 18-21, 2006

Mohamed A.M.O., Said R.A, Alshawawreh N., “Subsurface Sensing of Pollutants Via a Newly Developed TDR Probe” *Proceeding of the 3rd Annual Research Conference at the UAE University*, April 30th-May 1, Alain, UAE, D43-D46, 2002

AMO Mohamed, RA Said, N Alshawawreh, “A TDR System for Subsurface Pollutants Detection (I): Design and Modeling”, *TDR Symposium*, Northwestern University, USA, September 5-7, 2001

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

Research Posters

N. Alshwawreh, M. Militzer and D. Bizzotto, “Recrystallization in Electrodeposited Dual-Layer Copper Thin Films”, *18th annual meeting of Pacific Centre for Advanced Materials and Microstructures (PCAMM)*, Burnaby, Canada, December 7, 2013

N. Alshwawreh, M. Militzer and D. Bizzotto, “Microstructure Evolution in Electrodeposited Copper Thin Films for Advanced Microelectronic Applications”, 17th annual meeting of Pacific Centre for Advanced Materials and Microstructures (PCAMM), Burnaby, Canada, December 8, 2012

N. Alshwawreh, M. Militzer and D. Bizzotto, “Recrystallization of Electrodeposited Copper Thin Films”, Electrochemical Society Canadian Section Spring Symposium, Simon Fraser University, Burnaby, Canada, April 24, 2010

N. Alshwawreh, M. Militzer and D. Bizzotto, “Microstructure Evolution in Copper Interconnects”, 15th annual meeting of Pacific Centre for Advanced Materials and Microstructures (PCAMM), Vancouver, Canada, December 11, 2010