

## MUSA O. ABDALLA

Present: University of Jordan  
Mechanical Eng. Dept.  
Amman – Jordan

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Queen Alia Airport  
Amman – Jordan

**CAREER OBJECTIVES**      **Research, design, and development in industrial control systems.**

### EDUCATION

Ph.D. in Control Systems and Dynamics (ME) – December 1999  
University of Houston – Houston, Texas

MS in Mechanical Engineering – August 1992  
Texas A&M University – Kingsville, Texas

MS in Electrical Engineering – December 1991  
Texas A&M University – Kingsville, Texas

BS in Mechanical Engineering – January 1989  
University of Jordan – Amman, Jordan

### WORK EXPERIENCE

September, 2000-  
Present

**University of Jordan – Amman, Jordan**

#### **Assistance Professor**

Taught graduate and undergraduate courses in Control Theory, System Dynamics, Pneumatic/Hydraulic Systems Design/Control, Mechatronics System Design, and vibration theory. Advised graduate students in their thesis and dissertation research projects. Supervised undergraduate hands-on graduation senior engineering projects (design and implementation).

December, 1999  
October 2000

**University of Houston – Houston, Texas**

#### **Post Doctorate**

Performed multiple research projects on Fault Detection and Isolation (FDI).

January, 1996-  
December 1999

**University of Houston – Houston, Texas**

#### **Research and Teaching Assistance**

Designed a cantilevered beam testing bed with different damage scenarios. Performed modal testing and modal analysis. Exposed to data acquisition systems, accelerometers, strain gauges, digital filters, and other devices. Assisted professors in teaching classes in control systems and vibrations.

February, 1993-  
January 1994

**Parke Dewatt Medical Laboratories – Northbrook, Illinois**

#### **System Engineer and Software Developer**

Installed and administered an Ethernet Local Area Network (LAN), interfaced medical Machines to personal computers, developed database programs, designed remote computer routines, and solved software and hardware problems.

May, 1990-  
December 1995

**Texas A&M University – Kingsville, Texas**

**DelMar College – Corpus Christy, Texas**

#### **Mathematics Lecturer**

Taught undergraduate math courses, such as Calculus, Business Math, and Algebra.

## SELECTED PUBLICATIONS

### JOURNALS

Abdalla, M., Shabatat, N., Al Qaisi, M., "Linear Matrix Inequality based Control of Vehicle Active Suspension System," *Vehicle System Dynamics Journal*, Vol. 47, Issue 1, 2009, pages 121–134, Taylor & Francis.

Abdalla, M., Euripeds, N., and Grigoriadis, K., "LMI-Based Filter Design for Fault Detection and Isolation Using a Reference Model," *Dirasat: Engineering Sciences*, Vol. 35, No. 1, 2008, pp. 35-43, University of Jordan.

Euripedes, N., Abdalla, M., and Grigoriadis, K., "Robust fault estimation of uncertain systems using an LMI-based approach," *International Journal of Robust and Nonlinear Control*, 2008; 18:1657-1680, Wiley InterScience.

Abdalla, M., and Alsmadi O. "Model Reduction via reducibility Matrix," *International Journal of Simulation and Modeling*, Donghua university (Eng. Ed.), 23, No. 6, 2006.

Abdalla, M., "Matrix Norms and their Sensitivity to Noise a Computational Study," *WSEA Transactions on Systems*, Vol. 4, No. 11, 2005, pp. 2096-2100.

Abdalla, M., "Matrix Norms and their Sensitivity to Noise a Computational Study," *WSEAS Transactions on systems*, Vol. 4, No., 11, 2005. pp. 2096-2100.

Abdalla, M., Grigoriadis, K., and Zimmerman, D., "An Optimal Hybrid Expansion-Reduction Damage Detection Method," *Journal of Vibration and control*, Sage Publications 122, No. 4, 2003, pp. 448-445.

Abdalla, M., Grigoriadis, K., and Zimmerman, D., "Enhanced Damage Detection Using Linear Matrix Inequalities Methods," *ASME: Journal of vibration and acoustics*, 122, No. 4, 2000, pp. 448-455.

Abdalla, M., Grigoriadis, K., and Zimmerman, D., "An Optimal Hybrid Expansion-Reduction Damage Detection Method," *Journal of Vibration and Control*, 122, No. 4, 2000, pp. 448-455.

Abdalla, M., Grigoriadis, K., and Zimmerman, D., "Enhanced Structural Damage Detection Using Alternating Projection Methods," *AIAA Journal*, Vol. 36, No. 7, 1998, pp. 1305-1311.

### CONFERENCE PROCEEDINGS

Abdalla, M., "Particle Swarm Optimization (PSO) for Structural Damage Detection," Proceedings of the 3<sup>rd</sup> International Conference on Applied Mathematics, Simulation, and Modeling (ASM'09), Athens, Greece, 2009.

Abdalla, M., "Model Reduction via Particle Swarm Optimization (PSO)," Proceedings of the 20<sup>th</sup> IASTED International Conference on Modeling and Simulation, Banff, Alberta, Canada, 2009.

Alsmadi, O. and Abdalla, M., "Reducibility Matrix Based Model Reduction via Recurrent Neural Network Tuning," Proceedings of the 26<sup>th</sup> International IASTED Conference on Modeling, Identification, and Control, Innsbruck, Austria, 2007.

Alsmadi, O. and Abdalla, M., "Order Model Reduction for Two- Time- Scale Systems Based on Neural Network Estimation," Proceedings of the 15<sup>th</sup> Mediterranean Conference on Control & Automation, IEEE, Athens, Greece, 2007.

Abdalla, M. and Alsmadi O. "Model Reduction via Reducibility Matrix," International Conference on Intelligent Systems and Knowledge Engineering, ISKE Shanghai, China 2006.

Dado M., Abdalla M., “An Automatic Continuous Filling Machine for Dry Bulk Material: A Case Study in Mechatronics System Design,” Proceeding of the 2<sup>nd</sup> International Conference on Mechatronics, ICOM’05, Kuala Lumpur, Malaysia, 2005.

Abdalla, M., Euripeds, N., and Grigoriadis, K., “Fault Detection and Isolation Filter for Linear Parameter Varying Systems,” Proceedings of the American Control Conference (ACC), IEEE, Arlington, Virginia, USA, 2001.

Nobrega, N., Abdalla, M., and Grigoriadis, K., “LMI-Based Filter Design for Fault Detection and Isolation,” 39th Proceedings of CDC, IEEE, Sydney, Australia, USA, 2000.

Abdalla, M., Grigoriadis, K., and Zimmerman, D., “Iterative LMI Expansion-Reduction damage Detection Method,” Proceedings of the American Control Conference, Chicago, Illinois, 2000.

Abdalla, M., Grigoriadis, K., and Zimmerman, D., “LMI Hybrid Expansion-Reduction Damage Detection Method,” Proceedings of the 18<sup>th</sup> International Modal Analysis Conference, San Antonio, Texas, 2000.

Abdalla, M., Grigoriadis, K., and Zimmerman, D., “Structural Damage Detection Using Strain Data via Linear Matrix Inequality Based Methods,” Proceedings of the American Control Conference, San Diego, California, 1999.

Abdalla, M., Grigoriadis, K., and Zimmerman, D., “Structural Parameter Identification and Damage Detection via LMI,” Proceedings of IFAC, The International Federation of Automatic Control, Beijing, p. R. China, 1999.

Abdalla, M., Grigoriadis, K., and Zimmerman, D., “Experimental Validation of the LMI Methods for Structural Damage Detection,” Proceedings of the 17<sup>th</sup> International Modal Analysis Conference, California, 1998.

Abdalla, M., Grigoriadis, K., and Zimmerman, D., “Enhanced Structural damage Detection Using Linear Matrix inequalities,” Proceedings of the 16<sup>th</sup> International Modal Analysis Conference, California, 1998.

Abdalla, M., Grigoriadis, K., and Zimmerman, D., “Enhanced Structural damage Detection Using Alternating Projection,” Proceedings of the 15<sup>th</sup> International Modal Analysis Conference, Orlando, 1997.

Abdalla, M., Wang, R., and McLaughlan, R., “Solving Lyapunov Equations Symbolically,” Proceedings of the International Federation of Automatic Control Conference, Evanston, Illinois, 1995.

## **RESEARCH INTERESTS Structure and Mechanical Systems**

Conducting research in the areas of structural damage assessment, model refinement, modeling and estimation, dynamics and control, vibration monitoring, intelligent structures, and system identification. Applying novel techniques for damage detection such as Linear Matrix Inequalities (LMI) and Fuzzy Logic (FL) to perform level-two and level-one damage detection and assessment. Performing modal testing and modal data extraction.

### **Mechanical and Aerospace Systems**

Pursuing research in multi-objective control design, Linear Matrix Inequality (LMI) formulations of multi-objective and robust control problem, parameter estimation, vibration control, and system identification.

### **Mechatronics systems**

Design and implementation of embedded mechatronic systems. Different control theories are to be tested, verified and validated using experimentation.

**INDUSTRIAL COURSES**

**Plant Startup, Comissioning and troubleshooting (frequent popular course),  
Root Cause Failure Analysis and Failure Modes (frequent popular course),  
Machinery Vibration Diagnosis and Control (frequent popular course),  
Rotating Machines Reliability,  
Reliability Centered Maintenance,  
Mechanical Seals,  
Control and Safety Valves,  
Pumps and Compressors.  
HART Based Instrumentation and Control Field Devices,  
Fieldbus Based Instrumentation and Control Field Devices,  
Instrumentation and Control Loops,  
Advance Process Control,  
Creative Thinking and Problem Solving, and  
Pneumatic and Hydraulic Systems.**

**HONORS & AWARDS**

- Hybrid car design team leader (2010-present)
- Hybrid solar-diesel system central heating designer (Euro-boiler 2008-present)
- Emirates best graduation projects (second and third place, 2007)
- Engineering Union Best Projects (two years in a row, 2003)
- Solar car Mechatronics team leader, 2000 (45,000JD Project)
- ASNT Gerald E. Smith Award, 1998
- Who's Who Among Students in American Universities and Colleges, 1992
- Fellowships (1) and Scholarships (4) , 1990-1993

**PROFESSIONAL AFFILIATIONS**

- American Society of Nondestructive Testing (ASNT)
- American Institute of Aeronautics and Astronautics (AIAA)
- American Society of Mechanical Engineers (ASME)
- Institute of Electrical and Electronics Engineers (IEEE)

**HOBBIES**

Karate, Programming, Reading, Volleyball, Chess, and swimming

**REFERENCES**

Will be provided upon request

**CITEZENSHIP**

American