

Dr. Mohammad Rajab Almajali

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EDUCATION

1- **Ph.D.** in Mechanical Engineering, University of Dayton, Dayton, OHIO, USA, 2010.

Dissertation Title: Engineered Carbon Foam for Temperature Control Applications. Overall GPA: 4.0/4.0. (Distinguished)

2- **M.S.** in Aeronautical Engineering, Air Force Institute of Technology (AFIT), W. P. A. F. B., OHIO, USA, 2006.

Thesis Title: Effect of Phase Difference on Fretting Fatigue Behavior of Titanium Alloy. Overall GPA: 3.85/4.0 (Honored)

3- **B.S.** in Mechanical Engineering, Jordanian University of Science and Technology (JUST), Irbid, Jordan, 1989.

Project Title: Structure Analysis of Timoshenko Beam

Overall GPA: 79/100. (Very Good)

Highlights of Qualifications

- **Sep 1st 2016- present:** Chairman of Mechanical engineering Department, Moutah University
- **Jan 2016 – Present :** Assistant professor at Mechanical Engineering Department, Mouta'h University
- **May 2014- Jan. 2016:** Chief of Maintenance at Air Lift Wing (ALW)/Royal Jordanian Air Force (RJAF). My responsibilities include and not limited to; Supervision and overall control of all aspects of the Aircraft Engineering Group, to meet the technical specification and internal quality requirements.
- **Feb. 2013 – May 2014: King Abdullah II Design and development Bureau KADDB.** KADDB is the Jordanian Research, Design and Development entity created to provide solutions for Jordan Armed Forces and defense Agencies. I was assigned as a head of Aerospace System Design Section. I supervised engineers holding B.S and M.S who

involved in several projects including Unmanned Ground Vehicle, UAVS, Target Drones, and software and embedded system as follow:

- 1- **Explosive Ordnance Disposal (EOD)** system is an Unmanned Tracked Ground Vehicle (UTGV) designed to meet explosives disposal unit missions' requirements. It is effective in non- human intervention operations for its remote manipulation capabilities.
 - 2- **Mini UGV** is an observation and surveillance remote-controlled Mini-robot, that was designed to operate in Urban Environment.
 - 3- **Quad-rotor** is an electric Vertical Take Off and Landing (VTOL) Unmanned Aerial Vehicle (UAV). It demonstrates mechanical simplicity, low noise, stability and agility. It is equipped with a modern and extremely reliable autopilot.
 - 4- **Mini Unmanned Aerial System MUAS** is a compact autonomous fixed wing aerial system. The MUAS is portable and hand-lunched. Its modular design enables the user to swap between different payloads for rapid deployment. The system fulfills tactical and surveillance needs.
 - 5- In addition to the above, I supervised several undergraduate projects for students from Jordanian Universities. KADDB used to fund projects for Jordanian students trying to support the research and development capabilities in Jordan. These projects include the Unmanned Vehicles, Robots and Quad-rotor
- **Jan 2011 – Feb 2013 Directorate of Strategic Planning DSP at JAF-GHQ.** Member in Different Committees regarding Cooperation Defense and I proposed different kinds of Draft Agreements between Jordan and other Countries such as; USA, Saudi Arabia, France, Bahrain, Canada, South Korea, Australia, UAE, Brunei, ...etc.
 - **Sep 2006-Jun 2010 University of Dayton OH USA.** Research Assistant and PhD candidate sponsored by University of Moutah (Jordan), Jordan Armed Forces JAF and Great Dayton Area Graduate Students Institute (DAGSI). The following achievements were accomplished:
 - 1- Developing a numerical model for two energy equation by implementing a fast computational fluid dynamic software program (FLUENT).
 - 2- Designing hybrid foam by enhancing the thermo-mechanical properties of carbon foam using copper electroplating technique.

- 3- Designing a composite of carbon foam infiltrated with phase change material (PCM) for energy heat storage.
- 4- Conducting experimental and numerical works on pristine and hybrid foams infiltrated with PCM under constant and uniform heat pulse.
- 5- Designing a thermoelectric cooler (TEC) system for cooling vest application using heat exchanger and heat sink made of different materials (aluminum fins, pristine and hybrid foams) and different configurations (small and big holes and channels).
- 6- **Taught several lectures to graduate students in Fundamental of Nano Tech, Carbon Nano-technology and Thermal MGT-Elect Pack.**
- 7- Pursue PhD degree in Mechanical engineering

• **Aug 2004-Sep 2006 US Air Force Institute of Technology (AFIT) USA 2004-2006.** Seeking M.S in Aeronautical engineering sponsored by Royal Jordanian Air force.

The following tasks were achieved:

- 1- Pursued the M.S degree in Aeronautical Engineering.
 - 2- Conducted an experimental research on fretting fatigue of titanium alloy using Phase change angle between axial and normal loads.
 - 3- Developed a numerical model for contacting load mechanism by implementing ABAQUS software package
- **Feb 1990 - Aug 2004 Royal Squadron/RJAF:** Head of maintenance branch to supervise and lead engineers and technicians to conduct the preventive maintenance and repair the Royal Aircraft. Worked on different kind of A/C such as: **C-130, CASA, Super Puma, Blackhawk and Dovehaveland.**

Technical Background

- Structural material, structural analysis, and aeroelasticity.
- Strong background in **MATLAB/Simulink** and **LabView**.
- Comprehensive knowledge on contact mechanics and mechanical behavior of materials.
- Familiar with **Finite Element Method** and Analysis software (**ANSYS, Nastran, ABAQUS**).
- Passive and Active cooling system for thermal management applications.
- **Optimization**, dynamics, and Heat and mass transfer.
- Expertise in metrology, mechanical and thermal properties measurement and analysis, interface experiment set up to PC.

Research and Design Interests

1. Thermal Management Application
2. Plain and Fretting Fatigue for material.
3. A/C design and manufacturing specially for UAV
4. Structural Material and structural analysis.
5. Carbon and composite material including carbon nanotube.
6. Carbon Foam Treatment and Applications
7. Mechanical design.

Teaching interest:

- Thermal Courses
- Structural Material and Analysis
- Aerodynamics and Aeroelasticity
- Finite Element Method (FEM) and CFD
- Theory of Vibration and Control and Damping
- Thermodynamics
- Heat and Mass Transfer.
- Fracture mechanics
- Mechanic of Composite Material
- Math courses for engineers

Computer Skills

Operating Systems : MSDOS, Windows and UNIX.

Computer Languages: C/C++, Visual Basic, Visual C++, FORTRAN.

Scientific Applications : MATLAB/Simulink, Maple, MathCAD.

Software Package : ABAQUS, FLUENT, NASTRAN

Awards

- Graduate Scholarship, Dayton Area Graduate Studies Institute (DAGSI), 2007-2010.
- Graduate Assistantship, Dayton Area Graduate Studies Institute (DAGSI), 2008-2010.
- Summer Fellowship Award, University of Dayton, 2008.
- **Best Presentation Award, 3rd Annual Dayton Engineering Sciences Symposium (DESS), Wright State University (WSU), October 29, 2007.**

Affiliations

- Member in Sigma Gamma Tau (Aerospace Sciences Honor Society) since 12th of may 2005 (at AFIT).
- Member in American Carbon Society since 2007.
- Member in Society for the Advancement of Material and Process Engineering, SAMPE® since 2010.

Reports:

1. **M. Almajali**. "Engineered Carbon Foam for Temperature Control Applications". Ph.D Dissertation.
2. **M. Almajali** and S. Mall." Effects of Phase Difference Between Axial and Normal Loads on Fretting Fatigue Behavior of Titanium Alloy" Master Thesis at AFIT.

Reviewed Papers

1. **M. Almajali**, K. Lafdi, and S. Shaikh. "Interfacial and capillary pressure effects on the thermal performance of wax/foam composite. Journal of Applied Physics 102, 033506 (2007).
2. K. Lafdi, **M. Almajali**, and O. Huzayyin, "Thermal Properties of Copper Coated Carbon Foams". **Carbon**, 47; 2620-2626, 2009.
3. **M. Almajali** and K. Lafdi. " Assessment of carbon foam geometry during coating process". **Carbon**, 48 (2010) 4238-4247
4. **M. Almajali** , K. Lafdi, Paul, Ozden Ochwa. " Mechanical Properties of Copper Coated Carbon Foams". **Carbon**, 48; 1604-1608, 2010.
5. **M. Almajali**, K. Lafdi, and Paul, "Effect of copper coating on infiltrated PCM/foam" **Energy Conversion and Management** (2013), pp. 336-342.
6. D'Angelo¹, **M. Almajali**, K. Lafdi, A. Delort, and M. Elmansori." Augmented Cooling Vest System Subassembly: Design and Analysis": Journal of Energy Conversion Management (2014); 79:140–145.

Submitted papers:

1. **M. Almajali**, K. Lafdi, A. Delort, M. Elmansori, M. D'Angelo, and J. D'Angelo. "Designing Carbon Foam as Heat Exchanger in Thermoelectric Cooler System". To be submitted to International Journal of Carbon.

Conference papers and presentations

1. Presented paper, "Interfacial and capillary pressure effects on the thermal performance of wax/foam composite Journal of Applied Physics 102, 033506 (2007), in the American Carbon Society in Seattle (July 2007).
2. Attended 2nd Dayton Engineering Science Symposium DESS 2006 (ASME) at Wright State University.
3. Presented Two Publications at 3rd Dayton Engineering Science Symposium 2007 (ASME) at Wright State University. "Interfacial and capillary pressure effects on the thermal performance of wax/foam composite" Journal of Applied Physics 102, 033506 (2007) and the

submitted paper “ Thermal Properties of Copper Coated Carbon Foams”

4. Attended Blackhawk users’ conference with US Army, GE, and United Technology at Corpus Christi TX on March 1997.
5. Presented at Dayton Engineering Science Symposium DESS in Wright State University 2008 the publication “Mechanical Properties of Copper Coated Carbon Foams”. Carbon, 48; 1604-1608, 2010
6. Attended Midwest SAMPE conference -Society for the Advancement of Material and Process Engineering- at National Composite Center, Dayton. Ohio 2010 and presented the publication "Designing carbon foam as heat exchanger in thermoelectric cooler"
7. Presented three papers in the American Carbon Society in Clemson University South Carolina July 2010. . “Assessment of carbon foam geometry during coating process”. Carbon, 48 (2010) 4238-4247, “Coated Carbon Foam for Energy Heat Storage" Energy Conversion and Management (2013), pp. 336-342 and the submitted publication “Augmented Cooling Vest System Subassembly: Design and Analysis.
8. Attending the 2014 International Engine Management Program meeting at Indianapolis arranged by Rolls Royce to discuss the Deficiencies and projects related to T-56 Engines.
9. Leading the RJAF technical team in attending the 2015 Black Hawk users conference conducted in Huntsville AL, USA.

References

Prof. Khalid Lafdi, PhD

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I took classes with him and did some projects

Dr. Shaher M. A. Rababeh

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