

## Sohail Mazher Ali Khan Mohammed

King Saud University

Riyadh, 11421, Saudi Arabia

[sohailmazher5@gmail.com](mailto:sohailmazher5@gmail.com) • [Homepage](#) • Mobile: +966-560937824

### EDUCATION

**Master of Science**, Mechanical Engineering

May 2015

King Saud University

Riyadh, Saudi Arabia

Dissertation Title: *Bonded Composite Patch Repair of Aluminum Plates under Fatigue Loading*

GPA: 4.53/5 (A with Distinction)

**Bachelor of Engineering**, Mechanical Engineering

June 2011

Osmania University

Hyderabad, India

Dissertation Title: *Experimental Investigation of MR Damper Effect on Surface Finish during End Mill Process*

GPA: 79 % (A with Distinction)

**Intermediate Public Examination**

April 2007

Nalanda Junior College

Hyderabad, India

Advanced courses in *English, Mathematics, Physics and Chemistry*.

GPA: 95% (A with Distinction)

### RESEARCH INTEREST

Fracture mechanics and stress analysis are my major scope of research. However, other area of research include and not limited to damage mechanics, ageing of composites, failure analysis, repair techniques and mechanical alloying.

### WORK EXPERIENCE

**Research Associate**, King Saud University, Riyadh, Saudi Arabia. (2011- Present)

- Worked in technical projects as an Executive Researcher; the details are attached below.
- Worked on numerical analysis using ABAQUS and FRANC2D/L packages.
- Designed, analyzed and fabricated different machine tools in support of academic projects.
- Worked on dynamics of machine bodies, stress analysis of mechanical components and failure analysis of mechanical components during the academic projects.
- Carried out the experimental work, collected and analyzed the data.
- Conducted literature reviews and assist in writing the articles
- Prepare reports, conference articles and presentations
- Currently working on ageing of composites prepared using pre-pregs experimentally followed by repairing the aluminum structures using the aged composites.
- Fabricated nanocrystalline aluminum alloys by reinforcing with alumina and enhanced mechanical properties of the consolidated powder.

**Teaching Assistant**, King Saud University, Riyadh, Saudi Arabia, (2011- 2015)

Instructed Machine Design-II, Manufacturing Processes, Machine Design-I, Mechanics of Materials, SolidWorks, Engineering drawing using AutoCAD Fall 2013- (Spring 2012- Till date)

**Project Engineer**, Wipro Technologies, Hyderabad, India (2011)

- Trained to learn core competence in mathematical, scientific and basic engineering fundamentals necessary to formulate, analyze and solve hardware/software engineering problems and also to pursue advanced study or research.

## **Sohail Mazher Ali Khan Mohammed**

*King Saud University*

*Riyadh, 11421, Saudi Arabia*

[sohailmazher5@gmail.com](mailto:sohailmazher5@gmail.com) • [Homepage](#) • Mobile: +966-560937824

- Trained to work independently and cooperatively to deliver reports, programs, projects, and other deliverables that document a business organization's information technology requirements.

## **PROJECTS**

### **High-strength Bulk Nanocrystalline Al Alloy Processed by Mechanical Alloying**

*January 2016- December 2016*

*King Saud University, Riyadh*

- Al 6082 was prepared by adding appropriate material to pure aluminum by process of mechanical alloying and characterization has been done. The properties obtained were better than the as received Al 6082.
- To enhance the mechanical properties of Al 6082, Al<sub>2</sub>O<sub>3</sub> in different proportions were added, consolidated and sintered.
- Characterization was done using XRD, mechanical testing SEM and TEM analysis. The work is in process of publication.

### **Effect of Composite Aging on the Performance of Patch Repair of Cracked Aircraft structures**

*April 2016- Present*

*King Saud University, Riyadh*

- Composite patches made of pre-impregnated carbon/epoxy material are joined with cracked metal parts using an adhesive (epoxy) material constitute an attractive restoration technique of reduced strength structures. However, the degradation of these assemblies (patch/adhesive) due to different modes of aging (climatic chamber, immersion in water) is still not completely known and is being addressed in this research
- The main objectives of the project is to analyze the effects of the aging level on the composite and adhesive characteristics and to develop crack growth models of repaired cracks with aged patches.
- The project was funded by the National Plan for Science & Technology, Saudi Arabia.

### **Bonded Composite Repairs in Aircraft Structures**

*April 2012- June 2015*

*King Saud University, Riyadh*

- The durability of bonded composite repair in aircraft structures was investigated experimentally and numerically using ABAQUS and FRANC/2DL. The different geometrical conditions of the patch were investigated on two different aluminum alloys i.e., Al 2024-T3 and Al 7075-T6, which are mainly used in the aircraft structures.
- Fatigue life, fatigue crack growth rates and fractography was studied for repaired and unrepaired configurations. The Stress intensity factors were calculated using finite element method and compared with analytical model. The experimental results were in good agreement with the numerical and analytical solution.
- The project was funded by the National Plan for Science & Technology, Saudi Arabia.

### **Effect of Co Additions on the Densification Behavior of the Ag-W Composite Powder**

*Jan 2014- Jan 2015*

*King Saud University, Riyadh*

- The Ag-W composite materials are widely used in electrical contacts due to their excellent welding and erosion resistance as well as superb thermal conductivity. However, these properties and characteristics are affected by the powder particle size, morphology and distribution of both elements within the composite. In this investigation, the main effort was concentrated on producing Ag-W composite powder with homogeneous structure. This involves investigating the effect of Co addition on the powder morphology using Scanning Electron Microscope.
- The Ag-W compacts produced were sintered below the melting point of silver phase to avoid any segregation between Ag and W. Finally the characteristics and densification behavior of the sintered compacts was studied and evaluated for contacts application using TEM.

### **Residual Stress Prediction in Spiral Welded Pipes**

*Feb 2012- Sept 2013*

*King Saud University, Riyadh*

- During the manufacturing process of pipes, high undesirable stresses are produced, called as residual stresses.

## **Sohail Mazher Ali Khan Mohammed**

King Saud University

Riyadh, 11421, Saudi Arabia

[sohailmazher5@gmail.com](mailto:sohailmazher5@gmail.com) • [Homepage](#) • Mobile: +966-560937824

- In this project, the nature and magnitude of spirally welded pipes was studied experimentally using a semi destructive technique known as Hole drilling method, using standard strain gage rosettes. The experimental results were compared with non-destructive X-Ray diffraction technique. The results were found to be in good agreement.
- Furthermore, the electrochemical behavior of the material present in these zones was investigated using electrochemical impedance spectroscopy (EIS) technique.
- The project was funded by the Advance Manufacturing Institute (AMI-CEREM) and the pipes were provided by Saudi ARAMCO.

### **Experimental Investigation of Metal Cutting Process under the influence of Magneto-Rheological Damping in End Milling Process**

Nov 2010- April 2011

Central Institute of Tool Design, India

- During the milling on aluminum and steel, at different cutting parameters, the surface finish was evaluated using magneto-rheological damper.
- The effect of surface finish during end milling process was improved using Magnet-rheological damper.
- The effect of microstructure was also studied during the investigation.

## **SKILLS**

### **Software**

CAD Software: SolidWorks, AutoCAD, CATIA

CAE Software: ABAQUS, ANSYS, FRANC/2DL

Mathematical: MATLAB, MS Excel, MS Word, Origin

### **Machine Tools**

Material Processing

Abrasive Water Jet, Lathe, Milling, Drilling, Extruder, Hydraulic and Electrical Press

Material Testing

Universal Testing Machine, Servo Hydraulic Fatigue Testing Machine, Electromechanical Fatigue Testing Machine

Material Characterization

Scanning Electron Microscope, Stereo Microscope, Optical Microscope, Hardness Tester

### **Language**

English (IELTS Overall: 8.0)

## **ACHEIVEMENTS**

- Publication “Analysis and Repair of Crack Growth Emanating from V-Notch under Stepped Variable Fatigue Loading” was selected as one of the best papers in the conference, *XVII International Colloquium on Mechanical Fatigue of Metals (ICMFM17)*, Italy, 2014
- President, *Engineers without borders*, MJCET Chapter, Hyderabad India, Sept 2009- Oct 2010.
- Member, *Society of Automotive Engineers*, India, August 2009- June 2011.
- Best Graduate Student award, *Indian Institute of Engineers*, 2010.
- Merit Scholarship Award, *Government of India*, 2008, 2009, 2010 and 2011.

## **PUBLICATIONS**

1. A Albedah, **Sohail M. A. Khan**, F. Benyahia, and B. Bachir Bouiadjra. “Experimental and numerical evaluation of the efficiency of bonded composite repairs of cracked Aluminum plates (2024 T3 and 7075 T6) considering material plasticity.” Accepted at *Journal of Aerospace Engineering* (2017).

2. Asiful H. Seikh, Hossam Halfa, Muneer Baig, **Sohail M. A. Khan** "Microstructure Characterization and Corrosion Resistance Behavior of New Cobalt-Free Maraging Steel Produced Through ESR Techniques." *Journal of Materials Engineering and Performance*, 2017, DOI: 10.1007/s11665-017-2568-z
3. Muneer Baig, **Sohail M. A. Khan**, Magdy M. El Rayes, Seikh A. Hossain. "Evaluation of residual stresses present in spirally welded API grade pipeline steel using the hole drilling method." *Material Testing*, Vol. 59, pp. 258-264, 2017, DOI: 10.3139/120.110994
4. **Sohail M. A. Khan**, Es-Saheb, M.E. Ali Mohsin. "Fatigue Behaviour of Cracked Aerospace Grade Aluminium Repaired with Bonded Composite Patch: Experimental Study." *Chemical Engineering Transactions*, Vol. 56, pp 1627-1632, 2017. DOI: 10.3303/CET1756272
5. **Sohail M. A. Khan**, Es-Saheb, M.E. Ali Mohsin. "Fatigue and Fracture Behaviour of AA 7075-T6 Plates Repaired at Different Crack Lengths." *Chemical Engineering Transactions*, Vol. 56, pp 1873-1878, 2017. DOI: 10.3303/CET1756313
6. **Sohail M. A. Khan**, Es-Saheb. "Effect of Patch Thickness on the Repair Performance of Bonded Composite Repair in Cracked Aluminum Plate", ICAAMM 2016, India. *Accepted in Proceedings of Materials today:2016*
7. A Albedah, **Sohail M. A. Khan** Fayçal Benyahia and B Bachir Bouiadjra "Effect of load amplitude change on the fatigue life of cracked Al plate repaired with composite patch," *International Journal of Fatigue*, Vol. 88, pp. 1-9, 2016.
8. Bachir Bachir Bouiadjra, Fayçal Benyahia, A Albedah, Bel Abbes Bachir Bouiadjra, **Sohail M. A. Khan**, "Comparison between composite and metallic patches for repairing aircraft structures of aluminum alloy 7075 T6." *International Journal of Fatigue*, Vol. 80, pp. 128-135, 2015.
9. **Sohail M. A. Khan**, Asiful H. Seikh, Muneer Baig, Magdy M. El Rayes "Electrochemical Corrosion Behavior of Spirally-Welded API Line-pipe Steel in Acidic and Salt Media" *Manufacturing Science and Technology*, Vol. 3(5), pp. 286-293, 2015.
10. A. Albedah, **Sohail M. A. Khan**, F. Benyahia, and B. B. Bouiadjra, "Experimental analysis of the fatigue life of repaired cracked plate in aluminum alloy 7075 with bonded composite patch," *Engineering Fracture Mechanics*, vol. 145, pp. 210-220, 2015.
11. **Sohail M. A. Khan**, Mahir Es-Saheb "Fatigue Crack Growth Analysis of Cracked Aluminum Plates Repaired with Bonded Composite Patch" *International Journal of Mechanical And Production Engineering*, ISSN: 2320-2092, Vol. 3(8), pp. 5-8, 2015.
12. Es-Saheb, Shahid M Azhar, and **Sohail M. A. Khan**. "Effect of Co Additions on the Densification Behavior of the Ag-W Composite Powder Compacts at Various Sintering Temperatures." *IIENG*, IIE.E0215031: pp. 42-48, 2015.
13. **Sohail M. A. Khan**, F. Benyahia, B. Bachir Bouiadjra, and A Albedah. "Analysis and Repair of Crack Growth Emanating from V-Notch under Stepped Variable Fatigue Loading," *Procedia Engineering*, Vol. 74, pp. 151-156, 2014.

#### UNDER REVIEW

1. **Sohail M. A. Khan**, A Albedah, F. Benyahia, and B. Bachir Bouiadjra. "Effect of Single Tensile Peak Overload on the Performance of Bonded Composite Repair of Cracked Al 2024-T3 and Al 7075-T6 Plates" Submitted to "Composite Structures (February 2017)"
2. Faycal Benyahia, **Sohail M. A. Khan**, B Bachir Bouiadjra, Abdulmohsen Albedah "Effect of adhesive disbond on the fatigue life of cracked aluminum alloy 2024." Submitted revised manuscript to "Journal of Adhesion Science and Technology (2017)"
3. A.O. Bouakkaz, A. Albedah, B. Bachir Bouiadjra, **Sohail M. A. Khan**, F. Benyahia, M. Elmeguenni. "Effect of the temperature on mechanical properties of polypropylene-talc composites" Submitted to "Journal of Thermoplastic Composite Materials" April 2017
4. A. Albedah, **Sohail M. A. Khan**, B. B. Bouiadjra, Bel Abbes Bachir Bouiadjra and F. Benyahia. "Effect of the overlap zone area on the efficiency of bonded composite repair to aluminum panels" Submitted to "Aerospace science and technology" April 2017

## **Sohail Mazher Ali Khan Mohammed**

King Saud University

Riyadh, 11421, Saudi Arabia

[sohailmazher5@gmail.com](mailto:sohailmazher5@gmail.com) • [Homepage](#) • Mobile: +966-560937824

5. N. Demmouche, A. Albedah, B. Bachir Bouiadjra, **Sohail M. A. Khan**, F. Benyahia. “Interaction between adherend plasticity and adhesive damage in metal/composite joint: Application to bonded composite repair to metallic structures” Submitted to “*Journal of Thermoplastic Composite Materials*” February 2017

## **References**

Available on request.