# Mohammed A. Elamin Mohammed

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## **Research Experience**

#### The Nonwovens Institute / NC State University

**Research Assistant** 

- Analyze the dynamic failure of nonwoven textile through implementing hands-on tensile tests.
- Investigating the high-strain rate behavior of nonwovens and strain-rate influence on the fibers orientation. •
- Improving the manufacturing speed of nonwoven textiles through conducting high strain rate tests.
- Preparing product data analysis for nonwovens manufacturers utilizing testing and high-speed imaging techniques.

#### The University of Akron

Graduate Assistant

- Developed novel experimental techniques to investigate impact and post impact response of composites structures. •
- Enhanced the design of the naval structures through assessing the dynamic failure of composite materials. ٠
- Proposed detailed experimental study concluding that operating the naval marines and the aerospace shuttles in cold • environments will reduce their strength by about 30%.
- Showed that using the suggested composite skin significantly enhances the strength of structures by about 60 %. •

# **Professional Experience**

The University of Utah **Teaching Assistant** 

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- Instructed the Strength of Materials lab and performed wide range of tensile, torsion, bending, hardness, buckling, and combined loading experiments.
- Instructed several undergraduate mechanical engineering courses such as Aerospace structures, heat transfer and thermodynamics.

#### **Khartoum North Power Station**

Mechanical Engineering Intern

- Sep. 2013– May. 2014 Assessed the performance of the largest thermal power plant in Sudan (400 MW) with the power plant engineering team.
- Provided detailed maintenance recommendations which helped reduce the operation cost of the cooling towers by ~17%.

## Education

| Ph. D., Mechanical And Aerospace Engineering   North Carolina State | Expected Dec 2021 |
|---------------------------------------------------------------------|-------------------|
| M.S., Mechanical Engineering   The University of Akron              | May. 2018         |
| B.S., Mechanical Engineering   University of Khartoum, Sudan        | Nov 2014          |

## Skills

Programming: MATLAB, LabVIEW. Productivity: LaTeX, MS Office. Finite Element Analysis (FEA): ABAQUS, ANSYS, COMSOL. Engineering Drawing: Solidworks, PTC Creo, AutoCAD. Experimental: Dynamic Testing, Split Hopkinson Bar/Kolsky Bar, Instron & MTS Testing Machines, Non-destructiveInspection, Image Processing, Digital Image Correlation (DIC).

# Publications and Research projects

#### **Publications:**

- M. Elamin, B. Li, K.T. Tan (2018). Impact damage of composite sandwich structures in arctic condition. Composite Structures, 192: 422-433.
- M. Elamin, B. Li, K.T. Tan (2018). Impact performance of stitched and unstitched composites in arctic conditions. Journal of Dynamic Behavior of Materials, 1-11. M.H. Khan, M. Elamin, B. Li, K.T. Tan (2018). X-ray Micro-Computed Tomography Analysis of Impact Damage Morphology in Composite Sandwich Structures due to Cold Temperature Arctic Condition. Journal of Composite Materials, 1-14. **Research Projects:**
- Fracture Behavior of Diabetic Patients Bones (Drop-tower, High Speed Camera): Developed impact experiments of sugar solution treated bone specimens, utilized high-speed imaging of the fracture process and extracted dynamic stress intensity factors and crack growth rates, Analyzed the structural changes responsible for increased bone fractures in diabetic patients.
- Impact Performance of Stitched Composites in Extreme Environments, (Instron 9350, Micro-CT): On NASA T650-35 stitched • polyimide laminates. Analyzed the temperature effects on the durability of NASA space shuttles. Provided detailed explanation on crack growth and non-visible impact damages to achieve safety and cost effectiveness.
- Experimentally Testing Liquid Crystal Thermoset Fiber Glass Composites Response to Impact (Laminate manufacturing, Droptower): Fabricated specimens using a powder layup methodology, Evaluated the impact performance of LCT composites using drop-tower system.
- Design of Gearbox System for a Peanut Oil Press Machine (Solidworks, AutoCAD): Applied mathematical models to calculate the transmitted forces in the Gearbox system. Suggested cost-effective materials with high damage tolerance. Provided the manufacturer with detailed drawings of the gearbox system using Solidworks and AutoCAD.

Raleigh, NC

Jan. 2019 – present

Aug 2016 - May 2018

Akron, OH

Salt Lake City, UT

Aug. 2018 - Dec. 2018

Khartoum, Sudan