Asonganyi A. Atayo

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Wichita State University
Ph.D. in Mechanical Engineering   May 2025
MS in Mechanical Engineering   May 2020
BS in Mechanical Engineering, minor in Mathematics.   May 2018

Selected Research Projects

PCMs in High Temperature Applications such as in Thermal Management for Electronics   2023 - Present

- Improving the heat transfer properties of PCMs, such as their thermal conductivity, to make them more effective in high temperature applications.
- Investigating the use of PCMs in combination with other materials, such as thermal interface materials and heat sinks, to enhance their thermal management performance in high temperature applications.
- Developing new encapsulation techniques to protect PCMs in high temperature environments and prevent them from losing their properties over time.

Enhancing Phase Change process using Computer Vision and Machine Learning   2023 - Present

- I am investigating the use of computer vision and machine learning techniques to improve the accuracy and efficiency of PCM heat transfer simulations and to optimize design of PCM-based systems in real-time using two different approaches.
- I use image processing algorithms to segment the images and identify the location of the solid and liquid regions of the PCM. It is used as input for the simulation to improve the accuracy of results.
- I use image processing techniques to extract the temperature information. This updates the simulation in real time by adjusting the heat flux at the inlet and outlet boundaries.

Phase Change with Improved Thermal Properties   2023 - Present

- Developing new phase change materials with improved thermal properties to enhance the storage capacity and phase change rates, such as modifying the chemical composition of PCMs, and incorporating functional materials such as graphene, carbon nanotubes, and metal oxides.
- This helps to store more heat and release it faster, which could have applications in field such as thermal energy storage, building insulation, and electronic cooling.

Laser Cutting of Austenitic Steel   2019 - 2023

- Developed a multiphysics process for cutting steel using CW Nd: YAG laser. Modeled the fluid dynamics of the system to obtain desired results and validated with the experimental work.
- Performed a sensitivity study to rank the importance of input parameters using variance-based methodology. The input parameters are laser power, cutting speed and focus distance.

Skills

- OpenFOAM, ANSYS fluent, Code_Saturne, Elmer, Paraview, CATIA V5, 3Dexperience and Creo PTC.
- Python, Pytorch, OpenCV, Scikit-learn, Numpy, Pandas, Matlab, Fortran 95, and LabVIEW.

Certifications

- Computational Data Science (Courses: Machine Learning, Computer Vision, Artificial Intelligence)
- Engineer-In-Training: Fundamentals of Engineering – Mechanical Engineering
- CATIA V5: Part Design and Sketcher

Internship and Teaching Experience

Teaching Assistant – ME 569: Mechanical Engineering Systems Lab   2018 – 2020

- I was a teaching assistant for course (undergraduate level ME systems lab) at Wichita State University.
- I organized and led recitation sessions, office hours and exam review sessions for approximately 25 students taking the course.
- I earned an overall rating of 4.5/5 on my course evaluations as a TA for this course.

Teaching Assistant – ME 398 and ME 522: Thermodynamics and Heat Transfer   Fall 2019

- I was a teaching assistant for course (undergraduate level of both thermodynamics and Heat transfer) at Wichita State University.
- I organized and led recitation sessions, office hours and exam review sessions for approximately 40 students taking the course.

Teaching Adjunct Professor – ME 250: Materials Engineering   Summer 2019

- I was a teaching professor for course ME 250 (undergraduate materials engineering course) at Wichita State University.
- I created, organized, and led teaching sessions, office hours and exam review sessions for approximately 25 students taking the course.
- I earned an overall rating of 4.0/5 on my course evaluations as a TA for this course.

Design Analysis Engineer Intern – Kuhn Krause Incorporated   2016-2017

- I worked as a finite element analyst at Kuhn Krause Inc. Performed structural simulation of agricultural components including linear static analysis, fatigue, dynamic and modal analysis, using Creo Simulate software.
- I utilized model prediction to evaluate design options and provided inputs for design improvement and optimization.
- Created 2D and 3D drawings of tillage and strip-till tool parts and assemblies using Creo.

Selected Publications

1. **A. Atayo**, S. Nannapaneni, M. Rahman, "Laser cutting of austenitic stainless steel using a Surrogate Modeling Approach." (IMECE 2023-90625). *ASME International Mechanical Engineering Congress and Exposition* (IMECE), New Orleans, LA, USA, November 2nd.

2. **A. Atayo**, M. Bashir, M. Rahman, R. Nair, "Analysis of laser cutting of 1.2 mm thick of austenitic stainless steel using CW Nd: YAG laser." (IMECE 2020-24513). *ASME International Mechanical Engineering Congress and Exposition* (IMECE), Portland, Oregon, USA, November 19-23.

3. **A. Atayo**, M. Bashir, M. Rahman, R. Nair, "Numerical Study and Experimental Comparison of laser cutting of 1.2 mm thick of austenitic stainless steel using CW Nd: YAG laser.", *Graduate Research and Scholarly Projects (GRASP) Symposium*, Wichita State University, Wichita, KS, USA. 5/1/2020

4. F. J. Desai, **A. Atayo**, M. Palanasamy, M. M. Rahman, E. Asmatulu, "Experimental Studies on Endothermic Reversible Reaction of Salts for Cooling," *Journal of Heat Transfer Engineering,* June 2020.