

Dedicated Senior Thermal Engineer with +10 years of experience, utilizing thermal fluid science to design, test, and analyze instruments and remove obstacles through problem-solving and leadership skills. Expert in heat exchange in relation to thermal fluid science, thermal storage energy using phase change materials, and CFD simulation and analysis. Talented in leading and designing fluid science courses, recognizing objectives and priorities in this field to effectively educate under/grad students.

Qualifications Summary

- Safety is always a priority following OSHA standard.
- Skilled in managing high volumes of work in a fast-paced environment while achieving outstanding results.
- Demonstrated strengths in overseeing and directing Innovation thermal lab and Qualification and certified Tests.
- Balance competing tasks, adapt to shifting priorities, and proactively address emergent issues.
- Engineer proven through high performance and resolving issues with creative and efficient solutions.

Career Experience

Sr. Thermal – CFD Engineer

Innovation Center, Tranter Inc., Houston, TX

2017 – Current

Demonstrated expertise in analyzing complex challenges and developing lasting solutions to reduce risk and drive operational excellence. Responsible for simulation and thermal analysis using STAR CCM+, overseeing the Innovation thermal lab, and directing technicians. A strong leader skilled at problem-solving and committed to action. Execute test plans, analyze data, and lead certification tests such as AHRI LLHE 400. Generate correlations and constants for sizing software based on HTRI. Troubleshoot for new and existing heat exchangers. Conduct thermal analysis of new and existing products (heat exchangers). Build consensus with cross-functional teams and maintain open lines of communication to facilitate smooth operations.

Role and Responsibilities

- Thermal Design and Optimization
 - ✓ Perform thermal calculations to design plate heat exchangers for specific applications.
 - ✓ Optimize heat transfer efficiency while minimizing pressure drop and energy consumption.
 - ✓ Develop and refine algorithms for thermal and hydraulic performance prediction.
- System Development
 - ✓ Customize designs based on the application (e.g., refrigeration, chemical processes, energy recovery).
 - ✓ Select plate geometry, material, and gasket type to match process requirements.
 - ✓ Address challenges like fouling and high viscosity media regard to uncertainty data.
- Simulation and Modeling
 - ✓ Utilize computational fluid dynamics (CFD) tools to model heat transfer and fluid flow.
 - ✓ Simulate thermal performance under varying operating conditions (e.g., temperature, flow rate, fluid type).
- Thermal Lab Management
 - ✓ Oversee the daily operations of the thermal lab, ensuring adherence to safety protocols and industry standards.
 - ✓ Design and conduct experiments to test and validate the thermal performance of plate heat exchangers.
 - ✓ Lead calibration, maintenance, and troubleshooting of laboratory equipment and instrumentation.
 - ✓ Develop and document standard operating procedures (SOPs) for thermal testing.
 - ✓ Manage data acquisition systems to ensure accurate and reliable test results.
 - ✓ Oversee the development of prototypes and validate performance through rigorous lab and field testing.
 - ✓ Directed and managed the innovation thermal lab, ensuring compliance with OSHA standards.
 - ✓ Conducted and certified qualification tests, maintaining high accuracy and reliability.
 - ✓ Balanced multiple tasks and adapted to shifting priorities to meet project deadlines.
 - ✓ Developed creative and efficient solutions to resolve technical issues, enhancing lab performance.
- Leadership & Collaboration

- ✓ Mentor and train junior engineers and lab technicians.
- ✓ Lead project teams and coordinate cross-functional efforts for thermal-related projects.
- ✓ Communicate technical findings effectively through reports, presentations, and client interactions.
- ✓ Drive innovation in thermal testing methodologies and CFD simulations to enhance company capabilities.
- ✓ Manage lab budgets, procure new equipment, and ensure efficient resource utilization.
- **Innovation and Research**
 - ✓ Investigate and apply advancements in thermal prospective (e.g., plate features such distribution area & heat transfer area corrugation) to improve thermal efficiency and durability.
 - ✓ Develop compact or high-performance plate heat exchanger solutions for emerging industries like renewable energy or hydrogen production.
- **Technical Skills**
 - ✓ Heat transfer and thermodynamics (single-phase and two-phase).
 - ✓ Strong knowledge of heat transfer principles, thermodynamics, fluid dynamics, and pressure drop analysis.
 - ✓ Experience with thermal testing equipment and instrumentation (e.g., flow meters, thermocouples, data loggers).
 - ✓ CFD software: ANSYS Fluent, STAR-CCM+, and Thermal design software: HTRI, in-house tools.
- **Soft Skills:**
 - ✓ Excellent problem-solving, analytical, and organizational abilities.
 - ✓ Strong leadership and team management skills.
 - ✓ Effective communication and technical writing proficiency.

Visiting Assistant Professor / Adjunct Professor

- **Midwestern State University, Wichita Falls, (Online) TX (2019 – Current)**
- **Georgia Southern University, GA (2016 – 2017)**
- **Manhattan College, New York & Bridgeport University, CT (2016)**

Empower students to excel in fast-paced, highly demanding environments that require strong problem-solving and leadership skills. At Midwestern State University, taught undergraduate quality management and supply chain. At Georgia Southern University, taught undergraduate thermodynamics, fluid mechanics, energy lab, and capstone design. At New York and Bridgeport University, taught graduate classes on applied thermodynamics and renewable thermal energy (special course). Skilled in people development and growing intelligent, high-performing individuals by providing the tools and knowledge needed to succeed.

Key Accomplishments:

- Communicate complex information effectively to students, ensuring a comprehensive understanding as an educator.
- Lead by example, instilling a culture of maximum potential, performance, and dedication in students.
- Possess expertise in thermodynamics, fluid mechanics, and renewable thermal energy.
- Contribute to capstone design projects for senior students, offering guidance and support.
- Successfully designed and implemented a Graduate Student course focused on Thermal Renewable Energy.

Additional Experience

Mechanical Engineering (Contract)

LEAS Engineering Company, Montville, NJ

Mechanical Engineer (Full & P-T)

Africa Motor Company - Mercedes Benz dealership,
Tripoli, Libya

Lecturer

Mechanical Engineering Dept., Tripoli University, Tripoli,
Libya

Teaching Assistant

Mechanical Engineering Dept. Tripoli University, Tripoli,
Libya

Education

Ph.D. Mechanical Engineering – Thermal Fluid Science

Lehigh University, Bethlehem, Pennsylvania

Master of Science: Mechanical Engineering – Thermal Fluid Science

Tripoli University, Tripoli, Libya

Bachelor of Science: Mechanical Engineering

Tripoli University, Tripoli, Libya

Publications

- Ali Elmozughi, Mahmoud Elsharafi, Pranaya Pokharel, Clayton Holmes, Madison Krahl, Musaad Aldawsari, Theo Rolle, SIMULATED MODEL FOR A NEW DESIGN OF THERMAL ENERGY STORAGE SYSTEM, ASME 2021 International Mechanical Engineering Congress & Exposition IMECE2021- 68202. (accepted and presented November 2021).
- Mahmoud Elsharafi, Ali Elmozughi, Pranaya Pokharel, Clayton Holmes, Madison Krahl, Musaad Aldawsari, Theo Rolle, Analysis of Thermal Energy Storage in GPHE Unit Using PCM Technology Experimentally, ASME 2021 International Mechanical Engineering Congress & Exposition IMECE2021- 67656. (accepted and presented November 2021)
- Mahmoud Elsharafi, Ali Elmozughi, Kelton Vidal, Rumelia Thomas, Saleh Almutairi, Thilanka Senevirathne, Joshua Lambricht, Energy Recovery Unit Using Phase Change Materials, ASME 2020 International Mechanical Engineering Congress & Exposition IMECE2020, Published Online: February 16, 2021.
- Ali F. Elmozughi, Laura Solomon, Alparslan Oztekin, Sudhakar Neti, Encapsulated phase change material for high temperature thermal energy storage – Heat transfer analysis, International Journal of Heat and Mass Transfer, Volume 78, November 2014, Pages 1135–1144
- Laura Solomon , Ali F. Elmozughi, Alparslan Oztekin, Sudhakar Neti, ASME 2014 International Mechanical Engineering Congress & Exposition, IMECE2014 Nov 14- 20, 2014, Montreal, Canada
- Weihuan Zhao, Ali F. Elmozughi, Sudhakar Neti, Alparslan Oztekin, Heat transfer analysis of encapsulated phase change material for thermal energy storage, International Journal of Heat and Mass Transfer Volume 63, August 2013, Pages 323–335
- Ali F. Elmozughi, Weihuan Zhao, Sudhakar Neti, Alparslan Oztekin, Thermal Modeling of High Temperature Energy Storage Using Encapsulated Phase Change Materials, ASME 2012 International Mechanical Engineering Congress & Exposition IMECE2012 November 9-15, 2012, Houston, Texas, USA.
- Weihuan Zhao, Ali F. Elmozughi, Alparslan Oztekin, Sudhakar Neti, Transient 2-D Heat Transfer Analysis of Encapsulated Phase Change Materials for Thermal Energy Storage, ASME 2012 International Mechanical Engineering Congress & Exposition IMECE2012 November 9-15, 2012, Houston, Texas, USA.
- Ali F. Elmozughi, Weihuan Zhao, Sudhakar Neti, , Alparslan Oztekin, Thermal Modeling of High Temperature Energy Storage Using Encapsulated Phase Change Materials, 6th International Conference on Advanced Computational Engineering and Experimenting International conference in Istanbul, Turkey, JULY 1-4, 2012.
- Ali Elmozughi, Mohamed Muntasser, Bo Nordell, Simulation of Vertical U-Tube Heat Exchanger, Effstock Conference, 2009, Stockholm, Sweden.