Ali F. Elmozughi, PhD

Principal Thermal Engineer | Heat Exchanger R&D | University Lecturer

Tripoli, Libya | +218 92 312 7676 | al.elmozughi@uot.edu.ly | linkedin.com/in/ali-elmozughi-b0b27834

PROFILE

Thermal-fluid engineer and R&D leader with 20+ years across industrial product development, CFD, experimental validation, energy systems and engineering education. Nearly a decade of plate heat exchanger R&D at Tranter; PhD research in high-temperature thermal energy storage using phase-change materials.

CORE EXPERTISE

Heat exchangers: Plate/gasketed HX design, thermal-hydraulic performance, qualification and AHRI LLHE 400 testing **CFD/modelling:** STAR-CCM+, ANSYS Fluent, MATLAB, FORTRAN, model validation **Thermal sciences:** Heat transfer, thermodynamics, fluid mechanics, two-phase flow, HVAC/refrigeration **Energy:** PCM storage, thermocline systems, CSP, energy recovery **Leadership:** Lab operations, test planning, technical reviews, mentoring.

PROFESSIONAL EXPERIENCE

Lecturer, Mechanical Engineering — University of Tripoli, Libya (2026–Present) — Teaching thermodynamics, heat transfer, refrigeration and air-conditioning.

Principal Thermal Engineer, Heat Exchanger R&D — Tranter Inc., USA (May 2017–2026) — Led thermal design, CFD and experimental validation; developed sizing tools; managed thermal lab and AHRI certification testing; mentored engineers; contributed to patent application under review.

Part-Time Online Lecturer — Midwestern State University, USA (2019–Present) — Senior design/capstone collaboration on PCM-based thermal energy recovery.

Visiting Assistant Professor — Georgia Southern University, USA (2016–2017); **Adjunct Lecturer** — Widener, Bridgeport, Manhattan College and Fairfield, USA (2015–2016) — Taught thermodynamics, fluid mechanics, energy science, computational methods and renewable thermal systems.

Postdoctoral Researcher / Research Assistant — Lehigh University, USA (2009–2015) — DOE-funded modelling of thermocline storage and encapsulated PCM for concentrating solar power; six industrial energy assessments through the U.S. DOE Industrial Assessment Center.

Consulting Engineer — LSEA Corporation, USA (2015); **Earlier roles in Libya** — University of Tripoli, Mercedes-Benz dealership and Libyan technical standards bodies (2000–2008) — HVAC/hydronic systems, workshop supervision, teaching, technical advisory and standards committee work.

EDUCATION

PhD, Mechanical Engineering, Lehigh University, USA (Jan 2015) — Heat Transfer Analysis for Encapsulated PCM for Thermal Energy Storage. **MSc, Mechanical Engineering**, University of Tripoli, Libya (Dec 2007) — Simulation and optimization of a ground U-tube heat exchanger. **BSc, Mechanical Engineering (Thermal Science)**, University of Tripoli, Libya (May 2000).

SELECTED PUBLICATIONS, MEMBERSHIP & TRAINING

Publications: Elmozughi et al., “Encapsulated phase change material for high temperature thermal energy storage – Heat transfer analysis,” *International Journal of Heat and Mass Transfer* 78 (2014), 1135–1144; Zhao et al., same journal 63 (2013), 323–335; additional ASME IMECE and Effstock papers on PCM storage and U-tube heat exchangers. **Professional:** HTRI corporate membership; Tranter Global Technical Committee for Plate Heat Exchangers (2022–2024); AHRI LLHE 400 testing certification. **Training:** Senior Leader and Management Training (July 2026); MIT Professional Education, Management of Technology: Roadmapping & Development (72 hours, 2024–2025); STAR-CCM+, ANSYS Fluent and Design of Experiments.

TEACHING, TOOLS & LANGUAGES

Teaching: Thermodynamics, Heat Transfer, Fluid Mechanics, CFD, Refrigeration/HVAC, Renewable Energy, Thermal Energy Storage and Mechanical Engineering Laboratory. **Tools:** STAR-CCM+, ANSYS Fluent, MATLAB, FORTRAN, SolidWorks, Tecplot, Excel/VBA. **Languages:** Arabic (native), English (fluent).