

Exponential Engineering & Scientific Consulting Mahdi Tlemsani Associate | Thermal Sciences Bowie

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Professional Profile

Mr. Tlemsani has a bachelors and masters degree in fire protection engineer with training in fire protection system design, heat transfer, fire dynamics, CFD modeling, and material flammability. This allows Mr. Tlemsani to effectively evaluate and test active and passive fire protection systems, evaluate material performance, conduct origin and cause investigations, and conduct CFD modeling to analyze and recreate fire events.

Mr. Tlemsani also has a background in wildland fire research and testing, codes and standards review, and image analysis via software tools such as MATLAB. This distinct set of background and training has allowed him to effectively design sprinkler systems, build CFD models in response to enclosure fire dynamics questions such as smoke filling, fire spread, remote ignition, and time to flashover. He is also capable of conducting ignition, fire spread, and thermal performance testing, and produce novel research in the fields of pyrometry and firebrand research. He is familiar and has performed widely used ASTM International ignition and fire spread tests and thermal analysis techniques involving Cone Calorimetry.

Mr. Tlemsani utilizes his diverse skillset to investigate failures in automatic sprinkler systems in commercial and storage occupancies, residential and commercial fires and explosions, water infrastructure and supply, construction and as-built drawing review, smoke alarm failure analysis and testing, failures in natural gas regulators and piping, firefighter personal protective equipment (PPE) failures, and evaluation of products and systems for safety and code compliance in accordance with National Fire Protection Association (NFPA), International Code Council (ICC), Underwriters Laboratories (UL) standards, and state/local codes. Mr. Tlemsani also has both small and large-scale fire testing experience compliant with internationally recognized standards (NFPA, ASTM, UL) involving flammability and ignition testing. In a laboratory setting Mr. Tlemsani performs testing, builds and fabricates equipment and test apparatus, and performs data collection and analysis using various types of instrumentation including measuring temperature, heat flux, wind velocity, pressure, volumetric flow, and gas concentration.

Prior to joining Exponent, Mr. Tlemsani conducted firebrand pyrometry research at the University of Maryland in the Department of Fire Protection Engineering. The graduate research involved the development of a novel color-camera pyrometry method to evaluate the temperatures of firebrands at various windspeeds with unprecedented repeatability and resolution. This involved knowledge of camera optics and image analysis outside of the thermal science knowledge required such as radiative heat transfer and fluid mechanics. The research culminated in findings on the temperature-time distribution of firebrand piles on an inert substrate used to inform a model of heat flux to the surrounding surface around the firebrand pile. This research was funded by Underwriters Laboratories (UL). In addition, Mr. Tlemsani has experience conducting research for the National Institute for Standards and Technology studying the mass and size distribution of firebrands across multiple tree species and moisture contents.

Academic Credentials & Professional Honors

M.S., Fire Protection Engineering, University of Maryland, College Park, 2022

B.S., Fire Protection Engineering, University of Maryland, College Park, 2021

Prior Experience

Graduate Researcher, University of Maryland (UMD), 2021-2022

Undergraduate Researcher, National Institute of Standards and Technology (NIST), 2020

Professional Affiliations

National Association of Fire Investigators — NAFI (member)

National Fire Protection Association — NFPA (member)

Society of Fire Protection Engineers — SFPE (member)

International Association of Arson Investigators - IAAI (member)

Publications

Presentations

Tlemsani, M. Measurement of Firebrand Pile Temperatures and Heat Fluxes Using Color-Camera Pyrometry. Society of Fire Protection Engineers (SFPE) SFPE 23 Annual Conference and Expo, October 8-12, 2023.

Additional Education & Training

FED Kitchen Suppression System Inspection, Testing, and Maintenance Hands-On Training, February 2023

National Association of Fire Investigators (NAFI), Advance Fire Investigation Training, September 2022

International Association of Arson Investigators (IAAI), CFI-Trainer Fire Protection Systems Training, September 2022

Keyence VHX-7000 Microscope Training, December 2022