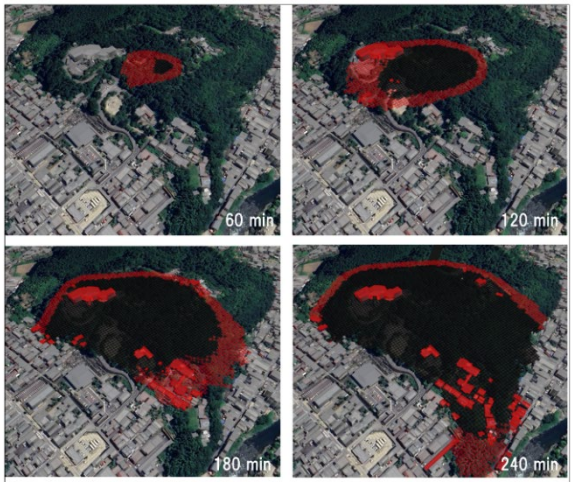
WPI

Fire Protection Engineering Department

FPE SEMINAR SERIES



Monday, November 4, 2024
11:00 – 12:00 pm
50 Prescott Street, Gateway II, Room 1226
Light refreshments to be served at 10:45am

Zoom link*:* https://wpi.zoom.us/j/4274730518

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Physics-based Modeling of Fire Spread in Densely-Built Urban Areas and its Applicability to the Modeling of Fire Spread in WUI

ABSTRACT

Urban fires remain a significant threat in Japanese urban areas. While numerous fire spread models have been developed, many rely on empirical formulations, limiting their generalizability. To address this, a shift towards physics-based modeling is essential. However, computationally intensive methods like CFD are often impractical for large-scale urban fire simulations. This presentation will introduce a fire spread model that balances computational efficiency with physical accuracy. By incorporating engineering correlations derived from fire experiments, the model offers a practical approach to simulating urban fire spread. Given the similarities between urban and wildland-urban interface (WUI) fire spread mechanisms, the proposed model can be extended to WUI fire simulations. The talk will conclude by discussing ongoing efforts to integrate this urban fire spread model with an existing forest fire spread model to predict WUI fire behavior.

BIOGRAPHY

Keisuke Himoto, Dr. Eng., is head of urban development laboratory at National Institute for Land and Infrastructure Management in Tsukuba, Japan. His research interests cover a broad range of fire safety issues in the built environment but with a special focus on large outdoor fires. He is the developer of various fire-related computational models, including one of the first physics-based computational models for fire spread in densely built urban areas.