1) Shaeri, P.[1], S. R. AlKhaled[2], A. Middel[3]. *Mean Radiant Temperature Modeling Using Deep Learning*

Mean Radiant Temperature (*Tmrt*) is a critical parameter in assessing outdoor human thermal comfort, especially in complex built environments. Traditional methods of quantifying *Tmrt* rely on expensive field measurements and computationally intensive approaches. We introduce a novel Physics-Informed Neural Network methodology for predicting Mean Radiant Temperature by integrating shortwave and longwave radiation estimations with numerical environmental features. Leveraging the comprehensive MaRTy dataset, our approach incorporates site-specific built environment characteristics and fisheye images to enhance predictive accuracy. To the best of our knowledge, this is the first time a PINN framework uniquely combines physical radiation equations with machine learning techniques, explicitly encoding fundamental radiative transfer principles as constraints within the neural network architecture. By integrating built environment features such as air temperature, geometric configurations, and image data as radiation components, the model provides a more nuanced, physically grounded, and contextually more accurate estimation of *Tmrt*. Through comprehensive deep learning validation, our PINN methodology significantly outperformed existing approaches, demonstrating superior predictive accuracy and generalizability across diverse urban thermal environments. The approach demonstrates the potential of physics-informed machine learning techniques in bridging the gap between complex physical measurements and data-driven predictive modeling, offering a promising avenue for more accessible and accurate thermal comfort assessments in diverse urban environments.

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2) Pouya Shaeri, Saud R. AlKhaled, and Ariane Middel. *Mean Radiant Temperature Modeling Using Deep Learning.*

3) Urban Climate and Air Quality