

## Editorial

This collection of these three research papers presents pioneering advancements across various domains, from enhancing our understanding of occupant behaviour in built environments to developing cost-effective health monitoring devices and improving the performance of recycled asphalt materials. Each study exemplifies the importance of integrating diverse methodologies and perspectives to address contemporary challenges.

The first paper highlights a novel approach to studying occupant behaviour by incorporating psychological, physiological, social, and temporal factors, alongside traditional environmental and contextual elements. Using Interaction Geography in a Virtual Reality (VR) museum, the study reveals how personal connections and study majors influence participants' exploration and time spent in the VR space. This comprehensive approach opens new avenues for understanding human interactions within built environments, offering valuable insights for designing more responsive and engaging spaces [1].

In the realm of cardiovascular health, the second paper addresses the critical need for accessible and accurate diagnostic tools in developing countries. By creating a low-cost, portable ECG device integrated with HealthyPi v3, a raspberry pi-based vital sign monitor, the researchers provide a sustainable solution for early detection and monitoring of cardiovascular diseases. The device captures real-time ECG data and other vital signs, employing advanced machine learning algorithms such as Support Vector Machine (SVM), Convolutional Neural Network (CNN), and Recurrent Neural Network (RNN) for accurate heart disease prediction. This innovation promises to enhance healthcare delivery and outcomes in resource-limited settings [2].

The third paper delves into the use of recycled asphalt shingles (RAS) in asphalt mixtures, addressing the challenges posed by the aged and oxidized RAS binder. The researchers introduce an innovative technique involving the interaction of RAS particles with rejuvenators before mixing with the asphalt binder. This approach compensates for the loss of low-molecular-weight fractions in the RAS, improving the modified binders' fatigue and thermal cracking resistance. By utilizing various rejuvenators, including pyrolysis oils and recycling agents, the study demonstrates how different particle sizes and rejuvenator types affect the stiffness and elasticity of the asphalt binders. These findings pave the way for more durable and sustainable asphalt materials, contributing to the broader goal of environmental conservation [3].

Collectively, these papers showcase the transformative potential of interdisciplinary research in solving complex problems and advancing knowledge across diverse fields. From enhancing occupant experience and healthcare accessibility to improving infrastructure sustainability, these studies highlight the critical role of innovation in shaping a better future.

### References:

- [1] H. Vo, P. Huesemann-Odom, "Using Interaction Geography to Explore Building Occupant Behaviors in Virtual Reality: A Pilot Study," *Journal of Engineering Research and Sciences*, vol. 1, no. 11, pp. 1–7, 2022, doi:10.55708/js0111001.
- [2] S.Md.R. Islam, A. Hossain, A. Abdullah, "Real-Time Acquisition and Classification of Electrocardiogram Signal," *Journal of Engineering Research and Sciences*, vol. 1, no. 11, pp. 8–15, 2022, doi:10.55708/js0111002.
- [3] E. Deef-Allah, M. Abdelrahman, "Enhancing the Contribution of Recycled Asphalt Shingles to Asphalt Binders Using Rejuvenators," *Journal of Engineering Research and Sciences*, vol. 1, no. 11, pp. 16–33, 2022, doi:10.55708/js0111003.

**Editor-in-chief**

**Prof. Paul Andrew**