

International Conference on Big Data Analysis and Data Mining

May 04-05, 2015 Kentucky, USA

Development of indoor air quality index and screening protocol in sub-tropical climate

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Maintaining acceptable indoor air quality (IAQ) for a healthy environment is of primary concern, policymakers have developed different strategies to address the performance of it based on proper assessment methodologies and monitoring plans. It could be cost prohibitive to sample all toxic pollutants in a building. In search of a more manageable number of parameters for cost-effective IAQ assessment, the probable correlations among the significant indoor environmental parameters listed in the IAQ certification scheme of the Hong Kong Environment Protection Department (HKEPD) in some Hong Kong air-conditioned environments were investigated. It consists of 9 indoor air pollutants: carbon dioxide (CO₂), carbon monoxide (CO), respirable suspended particulates (RSP), nitrogen dioxide (NO₂), ozone (O₃), formaldehyde (HCHO), total volatile organic compounds (TVOC), radon (Rn), airborne bacteria count (ABC) respectively. An 'IAQ index' was proposed, it correlated with an event of unsatisfactory IAQ regarding the 'failure' due to other unmeasured air pollutant levels in the IAQ assessments; which the IAQ index is defined as the average fractional dose to certain exposure limits from the assessed top dominant contributors identified from a regional database of IAQ assessment results for workplaces. The accuracy of the proposed assessment protocol was tested with a regional IAQ database developed from IAQ measurements of common air pollutants in air-conditioned offices. It is reported that the application of the screening process in the IAQ assessment would improve the overall assessment performance without additional measurement parameters. The proposed screening approaches would be a useful in setting up any IAQ assessment policies.

Biography

Mui Kwok-Wai is the Associate Professor in the Department of Building Services Engineering of The Hong Kong Polytechnic University. He obtained a BEng (Hons., First Class) degree and a PhD specializing in building environmental performance from the BSE Department at The Hong Kong Polytechnic University (HKPU). He joined the HKPU as a faculty member in 2000. Currently, he is an honourable international advisor for Hong Kong Indoor Air Quality Society, founding member and the co-chairman of the Technical Working Group (TWG) of ASHRAE HK Chapter.

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