ABSTRACT

The expansion of a city, created by a dispersal of activities; driven by scarcity of land in central areas, this has necessitated the movement of urban dwellers. Some of these activities have required movements to be made as far as nearby cities over great distances using various transportation modes. Activities such as recreation, commuting and shopping occur frequently in public spaces such as stations, shopping malls and stadiums. Due to the numerous activites generated by pedestrians, this situation affects the fluidity of movement in enclosed spaces, especially during evacuation. Therefore, the application of simulation technology has become a powerful tool in controling and managing crowds in public buildings. Masjid Jamek LRT Station is selected as a case study in order to demostrate the movement of pedestrians in an enclosed public space. Five objectives have been formulated to bridge the gap in literature - to determine walking behaviours of the pedestrian, to assess wayfinding behaviours of users from the entrance to the exit points during ingress and egress, to identify the factors influencing the movement flow of citizens in public spaces, to validate the simulated model with actual movements of pedestrians in the station building and to suggest and recommend the possible shortest path route based on walking behaviours during crowding events or emergency situations. Aiming at accurately and effectively assessing the movement of thousands of people in public spaces, this exploratory research captures invaluable data of real time users' movements. Applying the methods of video capturing and manual pedestrian counting, the study employed Siliconcoach to identify the walking speed and demographic characteristics of the pedestrians. The findings reveal that the average walking speed of a Malaysian is 1.48m/s, taking into account factors such as users' characteristics, as well as their familiarity with the attributes of the environment. The simulation package, SimWalk, is then applied to develop a simulation of users' movement based on these findings. The developed model will allow a visualisation of the movement of each user as an animation. Recommendations are proposed based on the developed model to overcome the issues and problems related with the flow movement of users in public spaces. Hence, it is beneficial for stakeholders, especially in the built environment and computing disciplines, to plan and design public spaces ergonomically at the preliminary phase. It is hoped that the research will be beneficial in contributing towards the planning and designing of potentially crowding public spaces in the future.