

Hub Traveler Guidance Signage Evaluation via Panoramic Visualization Using Entropy Weight Method and TOPSIS

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Abstract : Comprehensive transportation hubs are important nodes of the transportation network, and their internal signage the functions as guidance and distribution assistance, which directly affects the operational efficiency of traffic in and around the hubs. Reasonably installed signage effectively attracts the visual focus of travelers and improves wayfinding efficiency. Among the elements of signage, the visual guidance effect is the key factor affecting the information conveyance, whom should be evaluated during design and optimization process. However, existing evaluation methods mostly focus on the layout, and are not able to fully understand if signage caters travelers' need. This study conducted field investigations and developed panoramic videos for multiple transportation hubs in China, and designed survey accordingly. Human subjects are recruited to watch panoramic videos via virtual reality (VR) and respond to the surveys. In this paper, Pudong Airport and Xi'an North Railway Station were studied and compared as examples due to their high traveler volume and relatively well-developed traveler service systems. Visual attention was captured by eye tracker and subjective satisfaction ratings were collected through surveys. Entropy Weight Method (EWM) was utilized to evaluate the effectiveness of signage elements and Technique for Order Preference by Similarity to Ideal Solution (TOPSIS) was used to further rank the importance of the elements. The results show that the degree of visual attention of travelers significantly affects the evaluation results of guidance signage. Key factors affecting visual attention include accurate legibility, obstruction and defacement rates, informativeness, and whether signage is set up in a hierarchical manner.

Keywords : traveler guidance signage, panoramic video, visual attention, entropy weight method, TOPSIS

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