Validation of Models to Estimate Exposure in a Retail Layout using a 3D Virtual Environment

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In a retail setting, the design and layout of racks can have an effect on what products shoppers will see, and ultimately purchase on their trip. Recent research has focused on developing analytical and computational models to estimate visibility measures of new and up-and-coming layout designs. These models suggest that varying both the orientation and/or curvature of racks can potentially increase how much shelf-area a shopper can be exposed to from the main aisle. However, because of the human element involved in the shopping experience, it is vital to validate these models in a realistic setting. In lieu of a real store, we propose to validate our models using a 3D Virtual Environment (VE). The VE consists of 27 monitors that creates an immersive environment to simulate the dynamics of a shopper walking past a rack layout. The participants are asked to locate targets placed strategically on the racks, based on the predictions from our analytical models of whether or not each target would be exposed to the shopper. We share this unique way of validating analytical models and share our experiences. Preliminary results indicate our analytical model's sensitivity and specificity of 87% and 77%, respectively.