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Evaluation of UI for 3D Visualization-Based Building Information Applications

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Abstract : In scenarios where users have to work with large amounts of hierarchical data structures combined with visualizations (For example, Construction 3d Models, Manufacturing equipment's models, Gantt charts, Building Plans), the data structures have a high density in terms of consisting multiple parent nodes up to 50 levels and their siblings to descendants, therefore convey an immediate feeling of complexity. With customers moving to consumer-grade enterprise software, it is crucial to make sophisticated features made available to touch devices or smaller screen sizes. This paper evaluates the UI component that allows users to scroll through all deep density levels using a slider overlay on top of the hierarchy table, performing several actions to focus on one set of objects at any point in time. This overlay component also solves the problem of excessive horizontal scrolling of the entire table on a fixed pane for a hierarchical table. This component can be customized to navigate through parents, only siblings, or a specific component of the hierarchy only. The evaluation of the UI component was done by End Users of application and Human-Computer Interaction (HCI) experts to test the UI component's usability with statistical results and recommendations to handle complex hierarchical data visualizations.

Keywords : building information modeling, digital twin, navigation, UI component, user interface, usability, visualization
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