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**Indoor Furniture Placement Copilot: Leveraging Large Language Model for Optimal Design**

Nowadays, as people move into new houses, the standard for indoor furnishing is also rising. There will also be cases where people move into a new house, but with no furniture. How to plan and how to place furniture in the suitable place will puzzles them. Furniture placement significantly impacts the flow and functionality of living spaces. For both adults and children, the arrangement of furniture can either enhance or hinder daily activities. To address this challenge, my project will be introducing an Indoor Furniture Placement Copilot. This innovative system uses AI to analyze activity paths of users, including both adults and children, and recommends optimal furniture layouts based on their movement patterns. The copilot is designed to offer users personalized furniture arrangements that prioritize comfort, accessibility, and aesthetics.

1. User Stories

To design an innovative project, unique and vivid user stories are critically important. In this sense, several user stories were defined using ChatGPT prompts:

Story 1(Efficient Layout for Active Adults): As an adult with an active lifestyle, I need my furniture to be arranged in a way that minimizes unnecessary movement and maximizes efficiency in my living space. For instance, I want easy access to frequently used items like my work desk, kitchen, and sofa.

Story 2(Safe and Accessible Arrangement for Children): As a parent, I want my child's play area to be free from obstacles and hazards. Furniture should be placed in such a way that it allows my child to move freely and safely around the room, especially during playtime.

Story 3(Customized Layout Based on Room Size): As a homeowner with a small living room, I need to make the most of limited space. The copilot should suggest layouts that prevent overcrowding and allow for open pathways, making the room feel more spacious.

2. How ChatGPT Prompts Power These User Stories

The user stories for this project can be driven by interactions through ChatGPT prompts. By inputting specific details about their preferences and room dimensions, users can receive real-time suggestions for furniture placement based on Large Language Models. The following paragraphs are examples of ChatGPT prompts, starting with “Please generate a user story regarding to this situation:”

Efficient Layout for Active Adults Prompt: "I live in a one-bedroom apartment and I use my living room for both relaxation and working from home. How should I arrange my desk, sofa, and bookshelf to maximize space and minimize movement?"

Safe and Accessible Arrangement for Children Prompt: "My 3-year-old likes to run around the living room. How should I arrange the furniture to make sure they can move safely while still leaving space for a play area?"

Customized Layout Based on Room Size Prompt: "I have a small living room that's 12x14 feet. How should I arrange my sofa, coffee table, and TV stand to avoid clutter and keep pathways open?"