Store Employee Training Simulation

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***Abstract*—This project presents a virtual reality (VR) simulation designed for training store employees in customer service and operational tasks. The goal is to offer a safe, interactive, and repeatable training environment. The VR environment includes realistic store elements such as shelves, counters, customers, products, and interactive tasks. This project benefits retail businesses by reducing training costs, improving engagement, and allowing new employees to practice without real-world risks. The VR environment showcases routine scenarios, customer interactions, and problem-solving exercises.**

Keywords—Simulation, Employee Training, Particle System, Raycaster, Unity Game engine

I. Introduction (*Heading 1*)

The main goal of this project is to simulate a realistic store environment where employees can be trained on essential job functions. Objectives include developing scenarios for customer service, stocking, cashiering, and managing unexpected events like customer complaints or spills. The designed environment includes a fully modeled retail space with shelves, signage, counters, and animated customers. Users can interact with store objects and respond to tasks. The application targets new retail employees, store managers, and training coordinators. This VR training is useful because it reduces onboarding time, improves employee confidence, and avoids disruptions to actual store operations.

II. Related Work

Several VR-based training applications exist in healthcare, aviation, and industrial domains. Similar to those, this simulation applies immersive learning to retail. For instance, Li et al. (2020) explored VR in warehouse training, while Faiola and Matei (2021) examined VR in customer behavior studies. Research by Smith and Du (2018) and Kim et al. (2019) supports the idea that VR improves engagement and retention. Others such as Kavanagh et al. (2020) show how avatars and social cues help mimic real-world pressure. These studies guide our use of animated customers and timed scenarios. Unlike most VR studies focused on factories or education, this work targets retail, a less explored field.

III. Implementation

The simulation was developed in Unity 3D using C# scripting. First, 3D models were created in Blender and SketchUp, including store shelves, products, and avatars. These models were exported and textured inside Unity. Next, behaviors were added, such as pick-up events, proximity triggers, and animated characters. Scripts allowed interaction with products and customers.

Figure 1- Particle system and ray caster used to grab objects and turn of fire.

We also integrated Convai to provide unlimited, dynamic conversations with virtual customers. These customers have different moods and personalities, which change based on how the user interacts with them. This allows trainees to practice communication skills and respond to realistic customer behaviors. The system architecture includes a player controller, animated agents, interface canvas, sound manager, and Convai integration. Interactions are handled through sensors, raycasting, and AI dialogue systems.

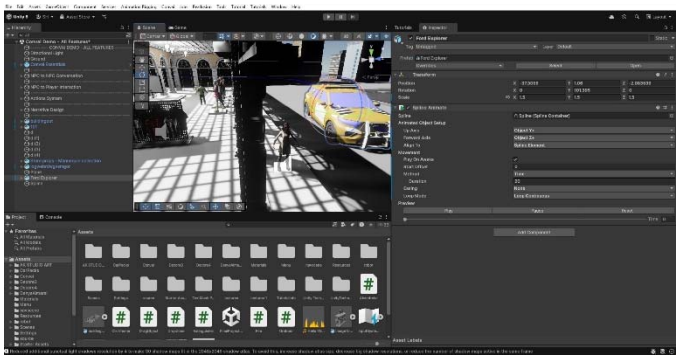

Figure 2- Scene and existing functions in it are visible in this image.

IV. Functionality

The VR scene includes textures for all shelves, floors, and products to provide realism. Ambient store sounds and voiceovers were added for immersion. Particle systems were used to simulate fire and water, allowing users to respond to emergency situations like spills or minor accidents. Characters are fully animated with lip-sync and eye movement connected to generative AI through Convai.

Figure 3- ConAi character conversation

This creates lifelike communication with customers showing different emotions. Cars move continuously in the background to simulate a real-world environment. Users trigger five interactions, including helping a customer, restocking, responding to a spill, using the cash register, and checking a price. Agents follow pathfinding behavior triggered by button input. Sensors include proximity triggers when near customers, time-based restocking events, and touch sensors on the register. A first-person player controller allows walking and looking around. The user interface includes a help button and task list. The system can later be extended to multiplayer or mobile VR using Meta Quest.

V. Conclusion

This simulation offers a complete retail training experience in VR. It helps reduce training costs, improves performance, and creates a safe learning space. It will be used by retail managers and HR trainers. VR was chosen because it allows safe repetition, realistic interaction, and immersion. One issue faced was aligning animations with user triggers. Also, more diversity in customer avatars could be added. In future work, we plan to expand tasks, add multiplayer, and support voice-based interaction.

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