We present a Mixed Reality system called Editing Reality, which integrates multiple Generative A.I. (GenAI) models. We have identified three functions: Addition, Erasure, and Modification. These functions are employed to add generated objects to the real environment, hide or subtract actual objects, and alter the real environment. Through the combination of GenAI and Editing Reality, users gain the capability to virtually manipulate reality in real-time with their speech. We conducted a pilot workshop with 14 participants to gather their thoughts. Our results show the potential usage of Editing Reality for interior design, prototyping for products, accessibility use, and also the exploration of security issues in MR.

In our system design, we have integrated our MR headset with a local server to address computational limitations. This strategic decision stems from the MR headset’s inherent constraints in running resource-intensive generative models. We separated the system into two parts. The MR headset processed the user input and sent the command via WiFi connection to the server. Then we offloaded the generative AI tasks to a local server equipped with a dedicated graphics card, efficiently processing the signals and downloading results back to the headset and displaying it in the MR environment. The generated result was uploaded to a cloud server and downloaded by MR headset. The reason of that is maintain all the multi players’ generative results are consistency.

We introduce the “Generative Cube,” a 3D outlined box created by pressing a button on the controller. Users can place, resize, and manipulate the cube in physical space using the controller’s grabbing feature. The cube operates in two initial states: Addition: Users trigger 3D model generation by speaking prompts into a dialogue bar. This state allows for color, grayscale, and transparency adjustments on the generated mesh. Reconstruction: Enables scanning of real-world objects or importing reconstructed models from other applications. This state includes the Erasure feature, where users can specify objects to be removed from the scene. Instead of color adjustments, users can modify the erasure cover’s brightness for scene matching.

Both states offer common editing functionalities—Copy, Delete, and Modification. Copy allows model duplication, Delete removes it, and Modification initiates a texture change through user prompts, enhancing object customization in the MR environment.

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Abstract

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