

Example Use Case and Prototype

For a 3D First-Person AR/VR Navigation System with Gesture Input

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Overview

A use case specification and accompanying prototype are presented. These artifacts demonstrate a design concept for a three-dimensional (3D) first-person navigation system for use in virtual reality (VR) and augmented reality (AR) experiences. The prototype features gesture-based input using the Leap Motion Controller.

Use Case

This use case specifies the behavioral interactions between the user and the system.

Name	3D First-Person AR/VR Navigation System with Gesture Input
Description	The user explores a 3D scene from a first-person perspective. The user wants to explore a different area and needs to get there quickly.
Audience	Any user exploring the 3D scene from a first-person perspective
Context	The 3D scene has specified interactive destination points. The user's hands are visible to the Leap Motion Controller.
Outcome	The user arrives at the desired destination within the scene.
Storyboard	See Figure 1
Actions	<ol style="list-style-type: none">1. The user extends an index finger to select the desired destination.2. The destination is highlighted using audiovisual cues.3. The user executes the closed fist gesture.4. The user executes the V gesture (extended index and middle finger).5. The user is teleported to the destination with a graceful transition.6. The use case ends.
Alternatives	<p>Change Selection</p> <p>From Actions 2:</p> <ol style="list-style-type: none">3. The user wishes to change the previously selected destination.4. The user extends an index finger to select a new destination.5. The previously selected destination is deactivated.6. The newly selected destination is highlighted using audiovisual cues.7. The use case continues from Actions 3. <p>Rotate View</p> <ol style="list-style-type: none">1. Prior to selecting a destination, the user wishes to see areas of the environment which are currently out of view.2. The user executes the closed fist gesture.3. The user executes the open palm gesture (all fingers extended).4. The user's view is rotated by 90 degrees.5. The preceding steps are repeated until the user is satisfied.6. The use case continues from Actions 1.

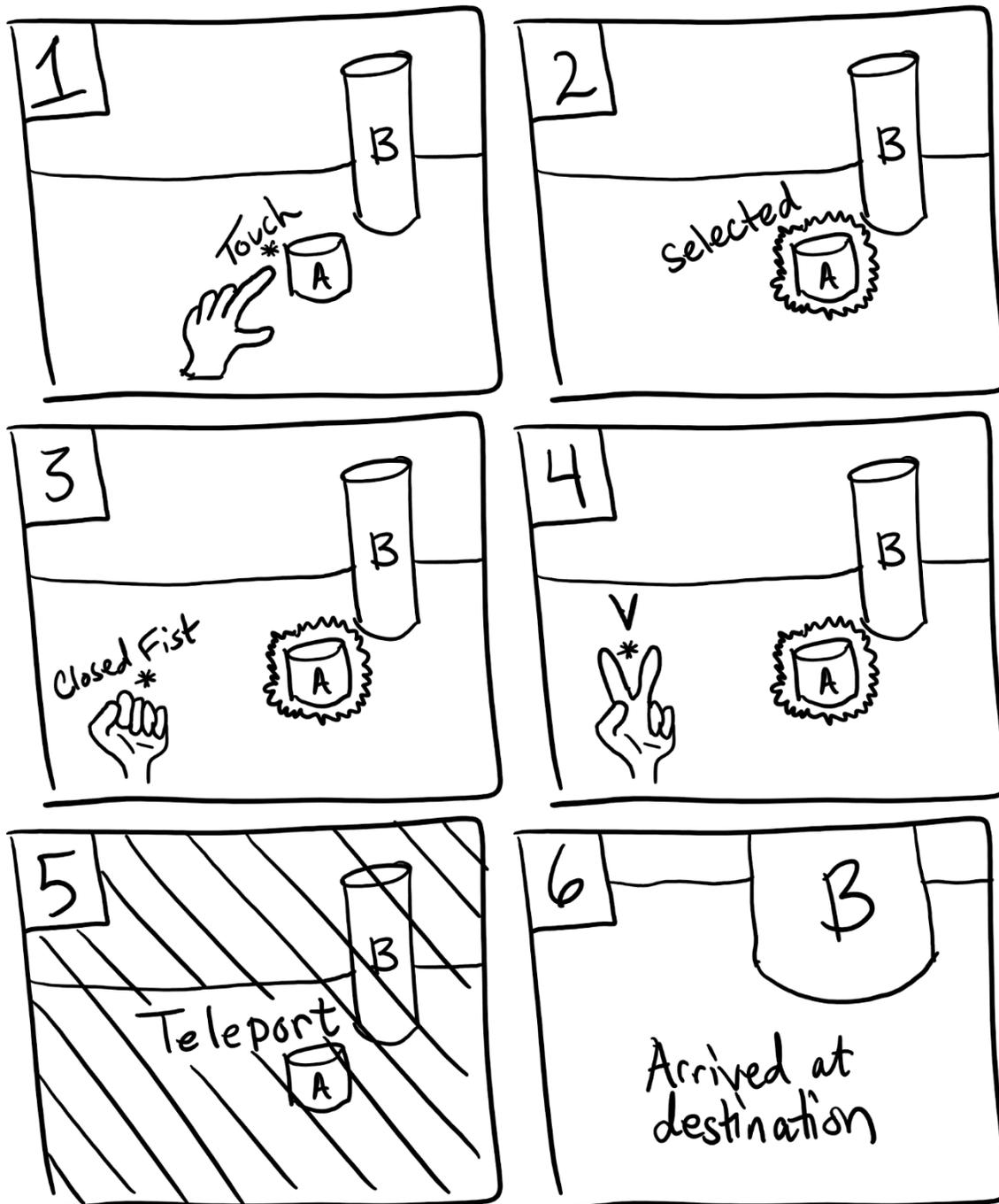


Figure 1. Storyboard for the 3D first-person navigation system use case.

Prototype

An interactive prototype was created to evaluate the use case (Figure 2).

- Demonstration video: <https://www.youtube.com/watch?v=5Qd2JfW5w44>
- Source code: <https://github.com/johnmquick/teleport>

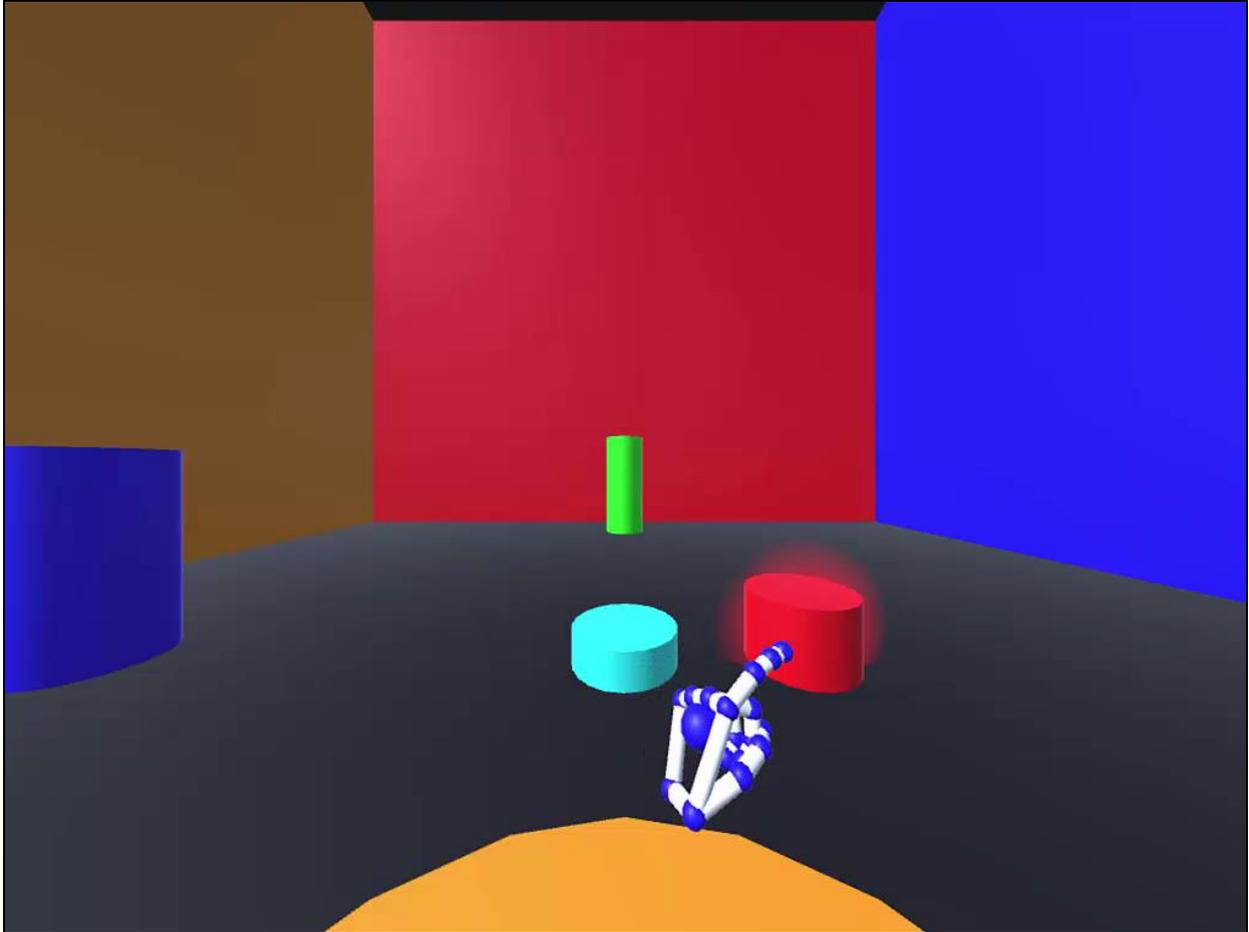


Figure 2. A user touches a platform to select it prior to teleporting.