# From Alt-Tab to World-Snap: Exploring Different Metaphors for Swift and Seamless VR World Switching

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Figure 1: Eight virtual world switching interfaces that support fast and seamless transitions across different virtual environments. Two preview types are used: (1) Portal and (2) World-in-Miniature (WIM). Four interaction metaphors were derived: (a) Gallery, (b) Head Palette, (c) Hand Palette, and (d) World Wheel. The selected environment is indicated by a yellow arrow ((a) and (d)) or a blue spherical cursor ((b) and (c)). The latter is highlighted with a yellow circle for clarity.

## Abstract

Today's personal computers and handheld devices afford users the ability to rapidly switch between different applications, e.g., using keyboard shortcuts and swipe gestures. In today's virtual reality (VR) systems, immersive applications are siloed experiences that users must fully exit before starting another. We demonstrate eight prototypes of world switching interfaces that let users preview, select, and transition across multiple virtual environments in a continuous interaction, mirroring the "Alt+Tab" agility of desktop multitasking. We developed these techniques based on portals and worlds-in-miniature (WiM) metaphors that reveal the destination environment before triggering a full transition. Demo video: https://youtu.be/koHZTYhdzWA

**Index Terms:** Virtual Reality, Transitions, Multitasking in VR, XR Productivity, 3D User Interfaces.

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## 1 Introduction

Modern desktop and mobile operating systems and interfaces support fast application switching through well-integrated mechanisms such as Alt+Tab and swipe gestures [7]. These interfaces are integral to productive computer use. For instance, information workers often switch between multiple application windows hundreds of times per hour to complete their tasks [9]. In contrast, switching between immersive applications in virtual reality (VR) remains cumbersome. Most current systems require users to fully exit one environment before launching another, breaking immersion and hindering multitasking. For VR to become a fully integrated platform for work and play, users will need a way to fluidly transition across independent virtual contexts.

In this demo, we present *World-Snap*, a suite of 8 interactive world-switching techniques designed to make transitions between virtual environments (VEs) as seamless and intuitive as desktop multitasking. We derived a design space that combines two spatial preview types: *portals* and *worlds-in-miniature (WiM)*; with four interaction metaphors: *Hand Palette*, *Head Palette*, *Gallery*, and *World Wheel*. These metaphors draw on well-established 3D UI concepts [1, 8, 10, 12] and adapt them for dynamic cross-world interaction. ISMAR attendees will be able to explore each technique hands-on using embodied interactions such as hand gestures and head gaze.

Attendees will have an opportunity to try our world switching

techniques and experience them in a structured coin collection task that involves frequent previewing, pre-orienting and transitioning between different worlds. The coin collection task consists of series of virtual object retrieval tasks, where users locate a coin hidden in one of several VEs, transition to that VE, grab the coin, and return to a home environment to deposit it in a chest. In this way, our demo will enable attendees to experience differences in spatial awareness, transition fluency, and interface control in both free exploration and a structured task, across our developed techniques. This task of retrieving content in one context and transferring it to another can be thought of as a simplified analogy to the common information worker task of copying and pasting content across applications.

With this demo, we aim to motivate discussion and future research on system-level interactions that support multitasking and productivity using VR.

## 2 WORLD-SWITCHING TECHNIQUES FOR PRODUCTIVE VR

We implemented **eight** interfaces that let users preview, select, and transition to new VEs in a continuous interaction. The interfaces are shown in Figure 1 and in our demo video[1]. We integrated two preview patterns: WiM and portal. The WiM preview consists of a 1:100 scale model of each environment [12] that appears inside a 0.11 m radius circle. A purple avatar within the WiM mirrors the behavior of the user's head and hands, helping them judge orientation before confirming the transition [3, 4]. The portal preview consists of a circular "window" that renders a real-time camera feed from the destination world [1, 6]. The view updates continuously, supporting rapid pre-orientation. Each of the preview patterns was integrated into 4 interaction metaphors. Each metaphor featured the world options depicted in thumbnail images, with a larger centrally-located preview object. The interaction metaphors are:

**Hand Palette** A 0.5 m circular palette is anchored to the user's left hand. *Interaction:* Left thumb—middle-finger pinch to show the palette; touch any outer thumbnail (0.08 m radius) with the right index finger to preview; release the pinch while touching to confirm.

**Head Palette** Identical layout to the hand palette, but the user selects worlds to preview using a head-gaze cursor. Releasing the pinch while gazing at a thumbnail triggers the world switch.

**Gallery** A head-fixed strip of thumbnails sits 0.8 m in front of the user, with a large live portal above. Lateral hand movement slides a yellow cursor. Non-linear gain affords quick scrolling across the environment thumbnail options, and the scroll snaps to the nearest thumbnail when hand velocity drops below a threshold. Releasing the pinch with an upward hand motion on a selected thumbnail triggers the transition.

**World Wheel** A steerable ring of world thumbnails floats between user's hands. Rotating hands spins the wheel, and spreading or squeezing hands scales it. A fixed apex cursor marks the selection point. Releasing the pinch while the cursor intersects a selected thumbnail triggers the transition.

**Point-to-Select (Baseline)** A 2D flat two-row thumbnail grid (2×3) appears 0.8 m in front of the user's right hand. Users point with a ray cursor [2], and releasing the pinch while highlighting an icon triggers the transition. This classic ray-cast interface [11] provides a no-preview baseline used for comparison.

## 3 IMMERSIVE MULTITASKING AND PRODUCTIVITY: CONTRIBUTIONS AND OUTLOOK

This demo offers the community a chance to engage with techniques derived from a design space for immersive world-switching interfaces. By combining two preview types (portals and WiMs) with four interaction metaphors, our system enables attendees to

explore how embodiment, spatial previews, and selection mechanisms impact the user experience of fast transitions between VEs.

All techniques are implemented in a modular and extensible system and will be released as open-source software. We hope this encourages further research into immersive multitasking, XR operating systems, and cross-context interaction design. Future directions include exploring the efficiency of our techniques in transitions between different VEs (e.g., indoor and outdoor with different clutter levels [5]) and VR applications. Additionally, we plan to refine adaptive interface layouts based on task type, and evaluate performance across different input modalities such as eye tracking and voice input within the context of multitasking in VR.

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[1]https://youtu.be/koHZTYhdzWA