Objestures: Bimanual Interactions with Everyday Objects and Mid-Air Gestures in Mixed Reality (Video Showcase)

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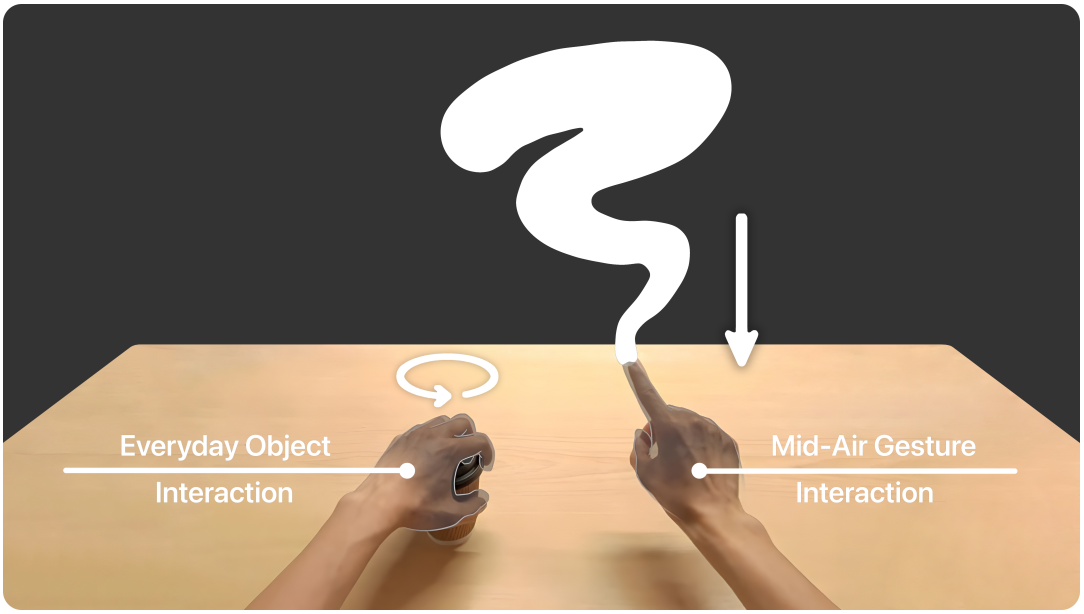

Figure 1: Objestures ("Obj" + "Gestures") is a design space and a functional prototype for bimanual interactions that combines everyday objects (e.g., a cup) and mid-air gestures (e.g., extending the index finger as a brush) to enable diverse applications in mixed reality. This figure illustrates one of them: drawing in 3D space while rotating the coffee cup like a dial to adjust the brush size. zhuoyuelyu.com/objestures

Abstract

Everyday objects have been explored as input devices, but their intended functionality is compromised when these objects are absent or unsuitable. Mid-air gestures are convenient, but lack haptic feedback. Combining both can be beneficial, yet existing work lacks systematic exploration. We address this by proposing a bimanual interaction design space for everyday objects and mid-air gestures, with a functional prototype using only hand tracking in mixed reality headsets. Study 1 with 12 participants on common 3D manipulations (Rotation and Scaling) showed that our approach was significantly more accurate, required less arm movement, and had no significant differences in task completion time or user experience compared to free-hand manipulations. Study 2 with the same group on real-life applications (Sound, Draw, and Shadow) found our approach intuitive, engaging, expressive, with interest in everyday use. We identified 30 potential applications across various fields, including everyday tasks, creative arts, education, healthcare, engineering, and gaming. This video showcase complements our full paper, where detailed results are presented.

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Our work leverages the natural synergy between human bimanual dexterity [1, 2, 8, 9] and the everyday objects that surround us [3–6], fostering a deeper connection between the human body, the physical world, and digital experiences. See the accompanying video and full paper [7] for details.

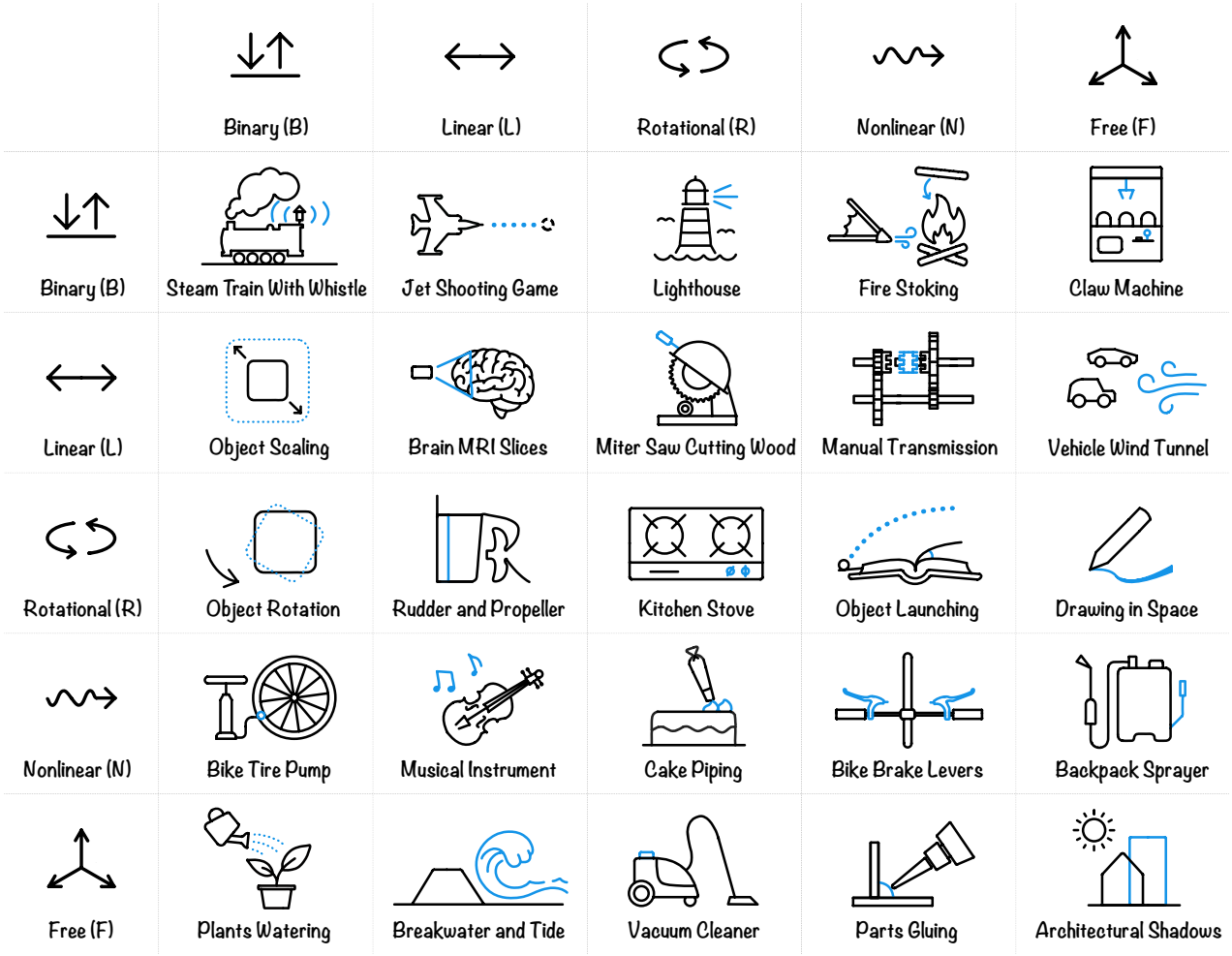

Figure 2: Mixed reality applications enabled by the design space of Objestures, where each hand in bimanual interactions performs one of five interaction types: Binary, Linear, Rotational, Nonlinear, or Free. See our full paper [7] for details.

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