RealitySketch: Augmented Reality Sketching for Real-time Embedded and Responsive Visualizations

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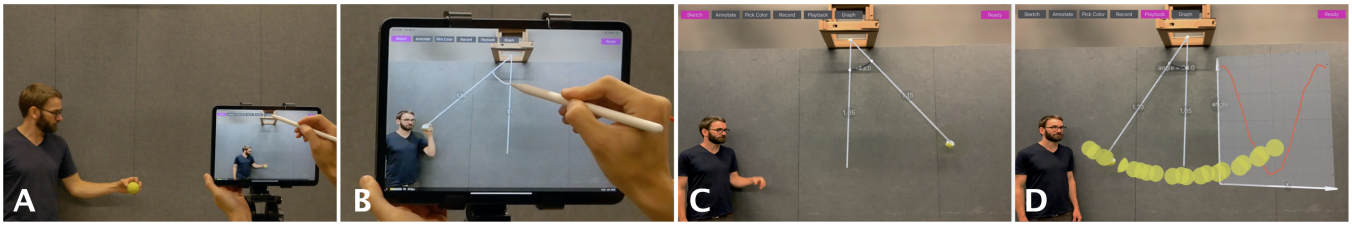

RealitySketch enables the user to draw and visualize physical phenomena like a pendulum's motion though real-time sketching: A) Select the ball to track, then draw a line and bind it with the physical ball. B) Draw a vertical line and an arc to parameterize the angle between the tracked ball and the center line. C) The sketched elements dynamically respond when the pendulum swings. D) Responsive graphics record and visualize the motion of the pendulum.

ABSTRACT

In this Real-Time Live, we demonstrate RealitySketch, an augmented reality interface for sketching interactive graphics and visualizations [Suzuki et al. 2020]. In recent years, an increasing number of AR sketching tools enable users to draw and embed sketches in the real world. However, with the current tools, sketched contents are inherently *static*, floating in mid air without responding to the real world. This paper introduces a new way to embed *dynamic* and *responsive* graphics in the real world. In RealitySketch, the user draws graphical elements on a mobile AR screen and binds them with physical objects in real-time and improvisational ways, so that the sketched elements dynamically move with the corresponding physical motion. The user can also quickly visualize and analyze real-world phenomena through responsive graph plots or interactive visualizations. This paper contributes to a set of interaction techniques that enable capturing, parameterizing, and visualizing real-world motion without pre-defined programs and configurations. Finally, we demonstrate our tool with several application scenarios, including physics education, sports training, and in-situ tangible interfaces.

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CCS CONCEPTS

• **Human-centered computing** → **Human computer interaction (HCI)**.

KEYWORDS

augmented reality; embedded data visualization; real-time authoring; sketching interfaces; tangible interaction;

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Figure 1: In-situ creation of a tangible UI slider.

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