

## Embodied Code: Creative Coding in Virtual Reality

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This demo presents a hands-on opportunity for users to explore a new, immersive, node-based platform for creative coding in virtual reality (VR). The Embodied Coding Environment (ECE) is a merged digital/physical workspace where coding tools, spatial representations of code, the scenes that are the output of the code, and user editing histories are co-located in a 3D space. Visual programming languages (VPL) have been used as an alternative to text-based programming since Sketchpad in 1963. However, the ECE transforms visual programming into an immersive experience, allowing users to enter the world where they are actively coding. Beyond immersion, embodied coding allows users to leverage 3D space to organize, annotate, and interact with their code in ways that would not be possible through 2D representation. Our research goals center on understanding how embodied coding can make learning to code more intuitive and elicit heightened engagement through the learning process. Demo visitors will experience embodied coding first hand through simple programming tasks (e.g., spawning objects, using arrays, creating conditional statements, and more) presented in the ECE via a Meta Quest 2 system. Presenters will guide users through the coding activities and discuss future directions. Handouts with brief descriptions of the ECE platform with links to [embodiedcode.net](http://embodiedcode.net) will be available. Access to the website will allow users to login and save their projects.

**Keywords:** Virtual Reality; Visual Programming; Creative Coding; Spatial Computing; Immersive Learning

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## Providing Students with Standardized, Cloud-Based Programming Environments at Term's Start (for Free)

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CS50.dev is a cloud-based programming environment offered to students taking CS50 and other CS courses at Harvard University, both on-campus or online. Built atop GitHub Codespaces, CS50.dev simplifies the initial challenges commonly faced by students and instructors because of the complexities involved in setting up programming environments at term's start. This demo offers an in-depth exploration of CS50.dev's architecture and presents a detailed guide on customizing Docker images and development container (devcontainers) to meet the specific needs of courses within GitHub Codespaces. The demo will also provide general guidance on how to help students transition from CS50.dev to using VS Code independently on their local machines at the term's end.

**Keywords:** code; containers; IDE; integrated development environment; programming; text editor

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