C+Pie

$C^+e^{i\pi}$ Synthetic Shared Environment in C++

Digital and Hardware Self-Determination in Human-Centric Augmented Reality

C+Pie is a shared synthetic interface designed for seamless collaborative work. A single graphical environment is shared across multiple computers, with C+Pie applications addressed equally via network locations. Participants can bring their work directly into another person's 3D field of view, where everyone can contribute in real time. Interaction is governed by shared behavior rather than rigid access control.A defining "synthetic" feature of C+Pie is its extreme modularity and live-replacement capability. The system or any application can be updated almost during execution. When only a few source files change, the highly efficient build process restores the full environment in 1 to 3 seconds on standard hardware. Other participants experience no interruption. This turns enthusiastic users into "live" co-creators of the software they are using.

Technical Implementation

C+Pie includes an integrated VPN component for secure peer-to-peer connections. Data objects are linked through a motor-sensory model that currently encompasses visual rendering, touch/keyboard input, and an abstract semantic network. The user is treated as an active part of the system via input and output hardware — giving the term "synthetic" a second, deeper meaning: the dissolution of the boundary between data, code, and human action. The perspective shifts from the machine to the human user; the screen becomes part of an extended sensory apparatus, an input device.

Societal Challenge Addressed

As augmented reality technologies advance, C+Pie ensures digital integrity by empowering communities to build and control their own shared environments. It lowers the barrier to complex programming, enabling people without deep IT backgrounds to actively shape the tools they use.

Current Status

A working demo supports three local users on an intranet and a fourth over the internet. Architecture refinement and easier application integration are ongoing.

Differentiation from Existing Approaches

While similar in spirit to some collaborative gaming platforms, C+Pie's architecture is fundamentally different: it prioritizes live code replacement, motor-sensory integration, and true shared ownership rather than game-specific mechanics.

Target Audience

Collectives, research groups, and educational settings where participants with varying technical backgrounds collaborate. Students can already use C+Pie to create LaTeX documents or visualize mathematical curves.

Key Milestones Ahead

- Deeper browser integration (currently using Chromium Embedded Framework).
- Implementation of hearing/audio within the same motor-sensory model.