OpenWorldLib: One Framework to Define and Run Every World Model

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The Peking University DataFlow team released OpenWorldLib, a unified codebase and a sharper definition for what a "world model" actually is. The term has been used for everything from next-frame video predictors to robot policies, which makes fair comparison nearly impossible. The paper proposes a single working definition: a world model is a system centered on perception, equipped with interaction and long-term memory, that understands

and predicts a complex world. The framework breaks that into five modules: an operator that handles input and interaction signals, a synthesis module for video, 3D, and robot actions, a reasoning module for spatial and multimodal reasoning, a representation module for 3D structure, and a memory module for long-horizon context. The GitHub repository ships under Apache 2.0 and already integrates 13 systems including Matrix-Game-2, Hunyuan-WorldPlay, Cosmos-Predict-2.5, WoW, VGGT, and the and . vision-language-action models, with 680 stars at the time of writing.

For anyone building or evaluating world models, this removes a real source of friction. Instead of cloning a different repo for each method and writing custom glue code to compare interactive video generation against 3D scene reconstruction or robot action prediction, you load a shared pipeline and call standardized methods. The paper's evaluation across these systems also surfaces a useful state-of-the-art map: Hunyuan-WorldPlay leads on visual quality for interactive video, VGGT can build 3D scenes but drifts geometrically under large camera motion, and . generalizes well across robot tasks but long-horizon physical consistency remains an open problem across the board.

The bigger shift is that world model research is starting to look less like one-off papers and more like a stack with shared interfaces. Once memory, perception, and action generation can be swapped independently, progress can compound across labs instead of restarting at each release.

Read More: Trinity of Consistency: a framework for measuring general world models

Sources:

- OpenWorldLib: A Unified Codebase and Definition of Advanced World Models (arXiv)
- OpenWorldLib GitHub repository
- OpenWorldLib HTML paper
- DataFlow project (parent codebase)
