

ALIVE: Artificial Life Interactive Video Environment

Pattie Maes, Trevor Darrell, Bruce Blumberg, Sandy Pentland

MIT Media-Laboratory
20 Ames St.
Cambridge Ma. 02139
pattie/trevor/bruce/sandy@media.mit.edu

Abstract

In this video we demonstrate a novel system which allows wireless full-body interaction between a human participant and a graphical world inhabited by autonomous agents. The system is called "ALIVE", an acronym for Artificial Life Interactive Video Environment. The goal of ALIVE is to present a virtual environment in which a user can interact, in natural and believable ways, with autonomous semi-intelligent agents whose behavior is equally natural and believable.

In ALIVE, a single CCD camera is used to obtain a color image of a person which is composited into a 3D graphical world. The composite world is projected onto a large video wall in a world-centered reference frame, which faces the user and acts as a type of "magic mirror". No goggles, gloves, or wires are needed for interaction with the world: agents and objects in the graphical world can be acted upon by the human participant through the use of domain-specific computer vision techniques that analyze the silhouette and gestures of the person.

The agents inhabiting the world are modeled as self-contained autonomous systems with internal needs and motivations which are embodied in a dynamic world: they sense the world via sensors, and move in, and act on the world in real time in response to the user's gestures and actions. As a result of the presence of these semi-intelligent entities, the system does not just allow for the obvious direct-manipulation style of interaction, but also a more powerful, indirect style of interaction in which gestures can have more complex meanings, which may vary according to the situation in which the agents and user find themselves.

The video presents a specific implementation of the ALIVE system which was demonstrated as part of SIGGRAPH-93's Tomorrow's Realities show. Approximately 500 attendees interacted with the ALIVE system over the course of 5 days. The video footage was taken during that time.

More information on the ALIVE system in general may be found in [Maes93] and [Darrell94]. Information on the details of the behavior and agent model used in ALIVE may be found in [Blumberg94]. More information on details of the visual routines may be found in [Darrell94].

References

- Blumberg, B. 1994. Action-Selection in Hamsterdam: Lessons from Ethology. In: The Proceedings of the Third International Conference on the Simulation of Adaptive Behavior, Brighton. Forthcoming
- Darrell, T., Maes, P., Blumberg, B. and Pentland, S. 1994. Situated Vision and Behavior for Interactive Environments, Technical Note No. 261. M.I.T. Media Laboratory Perceptual Computing, M.I.T.
- Maes, P. 1993. ALIVE: An Artificial Life Interactive Video Environment. In: Visual Proceedings, The Art and Interdisciplinary Programs of Siggraph 93. ACM, NY.