SHEEP: The Shared Environment Entertainment Pasture

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Abstract

In this demo, we use a multiplayer shepherding game to explore the possibilities of mutimodal, multiuser interaction with wearable computing in an intelligent environment.

The game is centered around a table with a beamer-projected pastoral landscape. Players can use different intuitive interaction technologies (beamer, screen, HMD*, touchscreen, speech, gestures) offered by the mobile and stationary computers.*

Building on our DWARF *framework, the system uses peer-to-peer, dynamically cooperating services to integrate different mobile devices (including spectators' laptops) into the game.*

Keywords: Frameworks, Augmented Reality, Intelligent Environments, Ad Hoc Services, Multimodal Interaction

1 The Game

The center of the game is a landscape with hills, fields, hedges, rivers and bridges, grazing sheep and stalking wolves. The landscape is projected onto a table by a beamer suspended above it.

The players can interact with the landscape and the objects in the scene in several ways:

- Every spectator with a network-capable laptop can take part immediately. He performs minimal installation on his laptop and can then control a sheep or wolf in the game. The sheep and wolves are semi-autonomous, with a tendency to stay together in a herd or hunt, but also the ability to be influenced separately.
- Several tracked laptops are installed near the corners of the main table. They are used to view the scene on the table three-dimensionally.

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Figure 1. Landscape with sheep and wolf

- There is also one god of that small world. He can add, remove and modify elements of the landscape. The god player wears a HMD. To perform multimodal input to the system, he can use various input channels for his interaction: speech, gesture and interaction with widgets that are displayed in the HMD.
- Every spectator can become a wizard. All that is needed is to put on a headset with a microphone. Then he can manipulate the scene with speech commands and a tracked wand.
- Two tracked palmsized iPAQs can be used to scoop up sheep from the table, carry them away from the table and shear or paint them. Afterwards they can be dropped back onto the table.

2 Technical Highlights

- Commercial optical tracking system (Thanks to Konrad Zürl of Advanced Realtime Tracking, Munich)
- Multimodal, multiuser interaction
- Distributed Scenegraph
- Three-dimensional rendering on palmsize devices
- Dynamically cooperating services
- Framework supports Linux x86, Linux StrongARM, Windows and Mac OS X