Window Seat

Interactive Chairware for Experiencing Virtual Spaces

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Window Seat is an interactive piece of furniture ("chairware") for viewing and navigating remote locations, such as a scale model of an building. We built a rocking chair as an interface to control two axes of movement of a camera in a remote site. A video projector and mirror are mounted on the chair to display the remote interior onto the wall of the room where the chair is located, to immerse the user in the virtual space.

Motivation

Window Seat is an ordinary person's virtual reality interface. Unlike a head-mounted display or CAVE, Window Seat does not require expensive special equipment. It's built from easy-to-obtain parts. We built the Window Seat to explore how an everyday artifact such as a rocking chair can be used to mediate the visual experience of a remote location. Window Seat users can inhabit a scale model while sitting in the chair watching the video projection on the wall in front of them. The image provides a sense of being inside what is otherwise an unoccupiable space. The Window Seat could also be used to experience full-scale remote locations, or models (or other data) at other scales.

Chair Components

The Window Seat consists of 5 parts; physical chair as input device, handyboard as control device like a 'brain', camera as 'eye', projector as display device, and images on the wall for immersive environment.
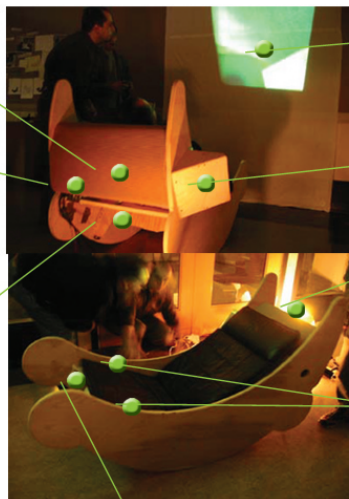

Projector:
A projector warpped inside a paper seat cushion projects images to the mirror.

Handyboard:
We used a Handyboard running an interactive C program to read the values from an infrared sensor and two pressure sensors and control two servo motors to tilt and pan a remote camera.

Infrared Sensor:
Beneath the chair an infrared sensor determines the distance to the floor, which the user controls by rocking gently forward and back

Book Shelf:
Stores books and act as counter weight to keep the chair upright

Display Device:
Users see projected images on a white shower curtain in the front of chair.

**Mirror Housing:**
Reflects projected images to the screen

Remote Camera:
The chair controls the view of a remote camera located in an architectural scale model.

Pressure Sensors:
Inside the armrests, two pressure sensors control camera panning.

Camera & Sensors

Infrared range finder senses the distance from the floor as users rock the chair back and forth. Pressure sensors act as switches to turn the camera left or right
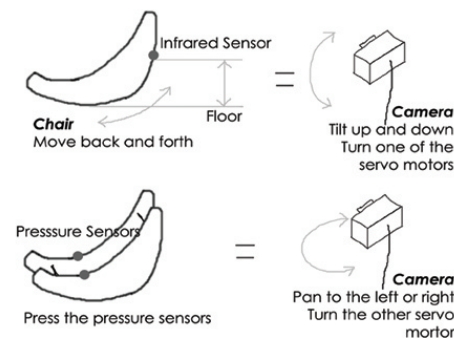
Controlled by the sensor values, two servo motors mounted at a right angle drive the camera in two axes (tilt and pan).