

Viewing AmbiSpace

The Use of the AmbiViewer to compose Worlds in Architecture

Werner Lonsing



Viewing AmbiSpace

- Concept
- Technical Overview
- Examples
- AmbiSpace

Viewing AmbiSpace

Concept

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Examples

Ambispace

Reality

Various usages of 'reality' are existing in combination with misleading adjectives like 'virtual', 'augmented', 'hybrid' or 'mixed'.

Reality is an entity in space and time.

'Virtual Reality (VR)' is a contradiction

Concept

Why AmbiSpace ?

Space is undecisive until it manifests in someones perceptive reception as his/her individual space.

Prefix “ambi-” = around

Main Entry: **ambi-**

Function: *prefix*

Etymology: Latin *ambi-*, *amb-* both, around;
akin to Latin *ambo* both,

Greek *amphO* both, *amphi* around

-- more at 'by'

: both <*ambivalence*>

Vitruvian Man

ambidextrous ambient



ambiguos ambition

Concept

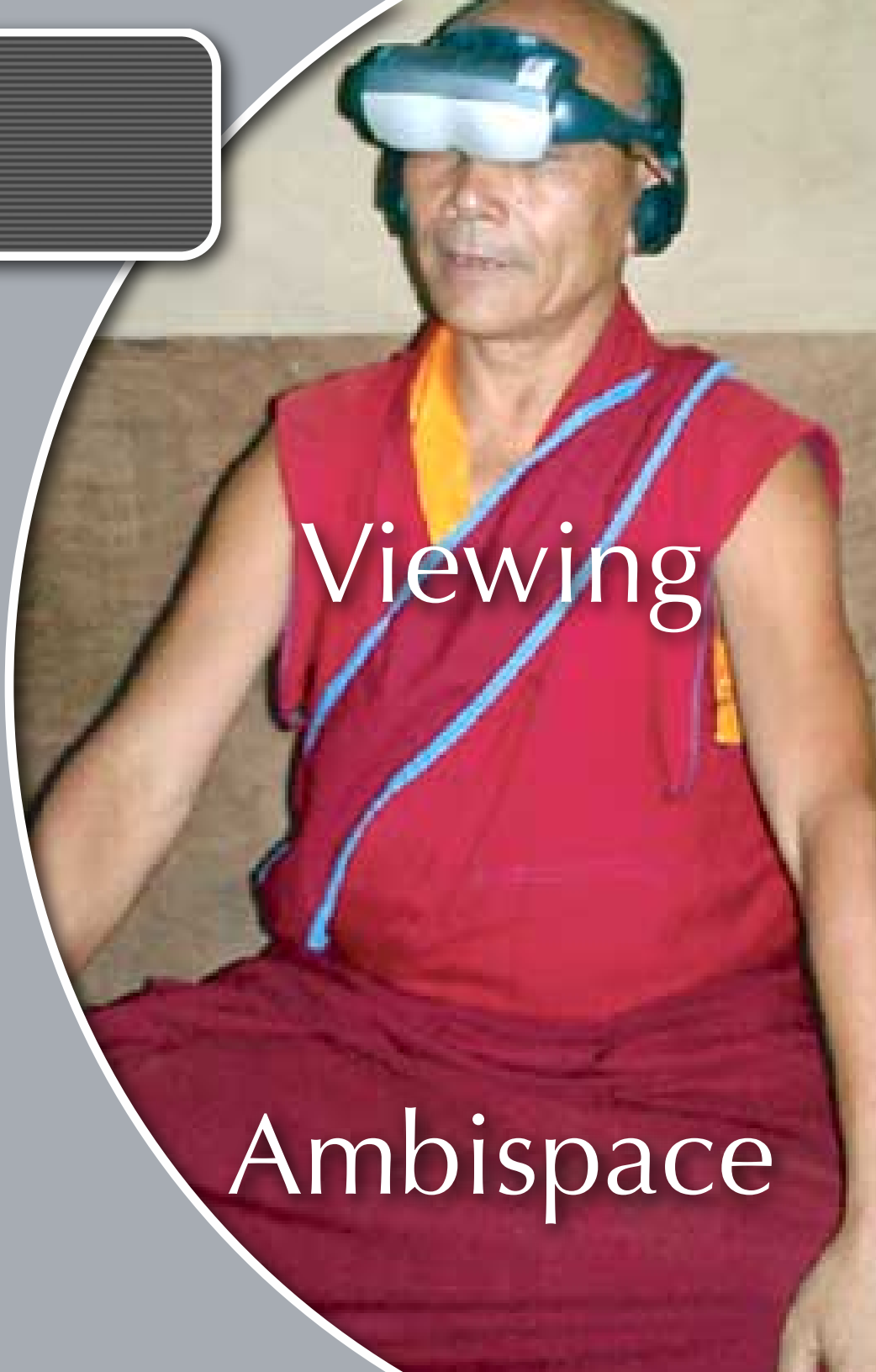
AmbiSpace is an attempt to describe the variant nature of space until it is perceived, independent of what and how space is perceived

Viewing

Ambispace

Concept

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Viewing

Ambispace

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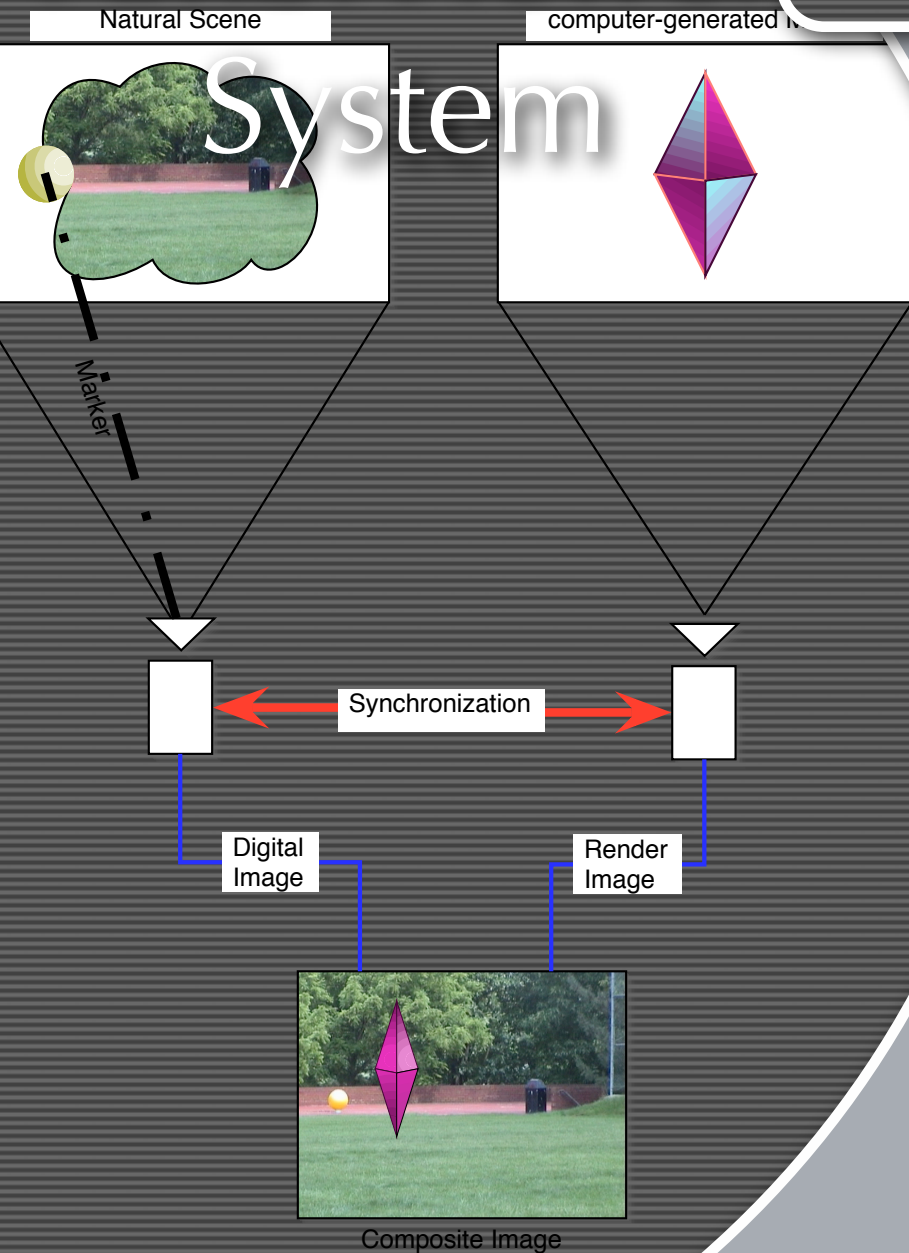
AmbiViewer System

Technical Overview

The program-system of AmbiViewer combines different devices and several parts of information technologies to allow a design on site and in situ.

AmbiViewer

Technical Overview



The program-system of AmbiViewer combines different devices and several parts of information technologies to allow a design on site and in situ.

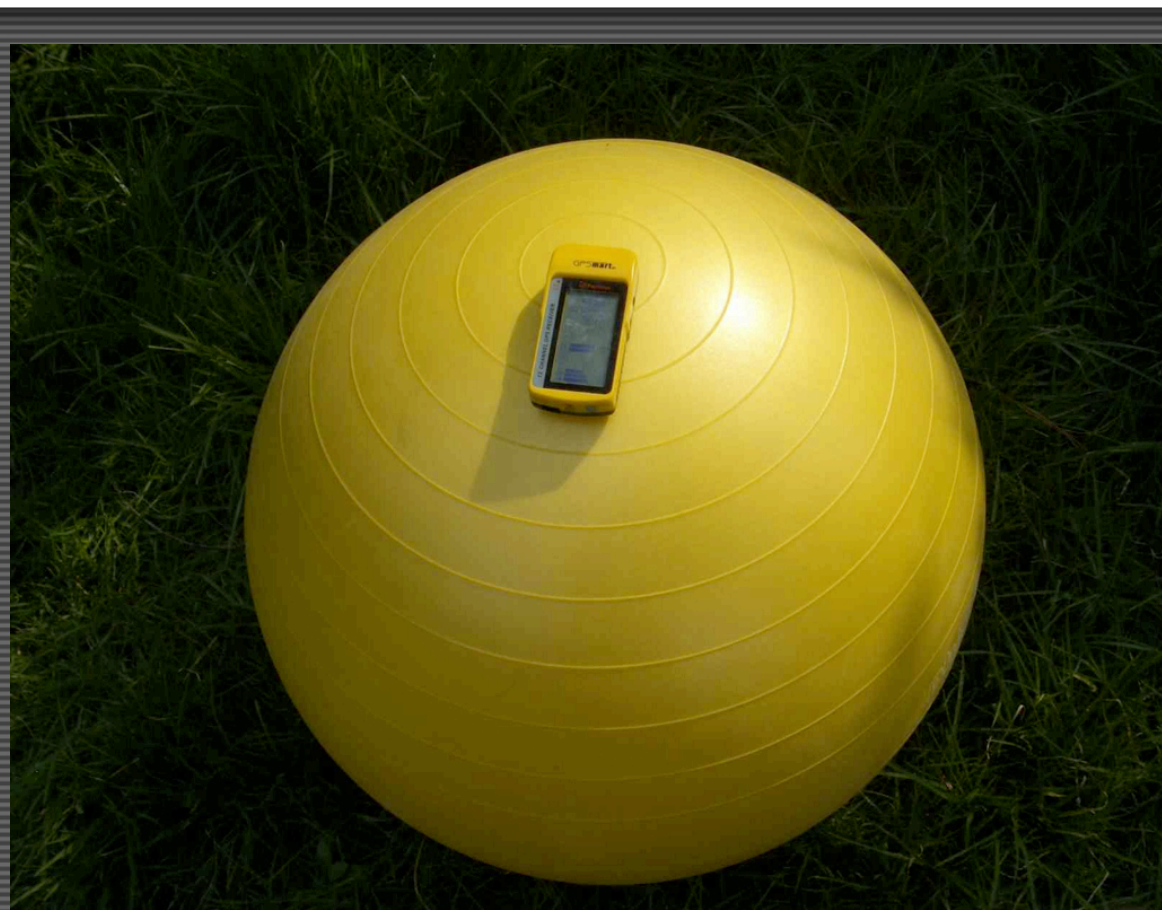
Marker, 72 cm (28 in.)



The fiducary feature of the system, the marker ball, is a yellow gymnastic ball with a diameter of 72 cm, (28").

The GPS is on top of the Marker, a camera is associated

Gymnastic Ball with GPS-device



Wireless GPS-device (BT),
fixed on top of the Marker.

Cameras with GPS-Devices



Computer and GPS-Devices



The screenshot displays a software interface for a GPS device. At the top, a window titled "GPS" contains a table with the following data:

Nr	Source
1	/dev/cu.usbserial0
2	/dev/cu.USA19Q182273P1.1

Below the table is a "get local Devices" button. At the bottom of the window are icons for a compass, a speedometer, and a satellite, along with a "Speed (km/h)" dropdown menu and "Compass" and "Satellites" buttons.

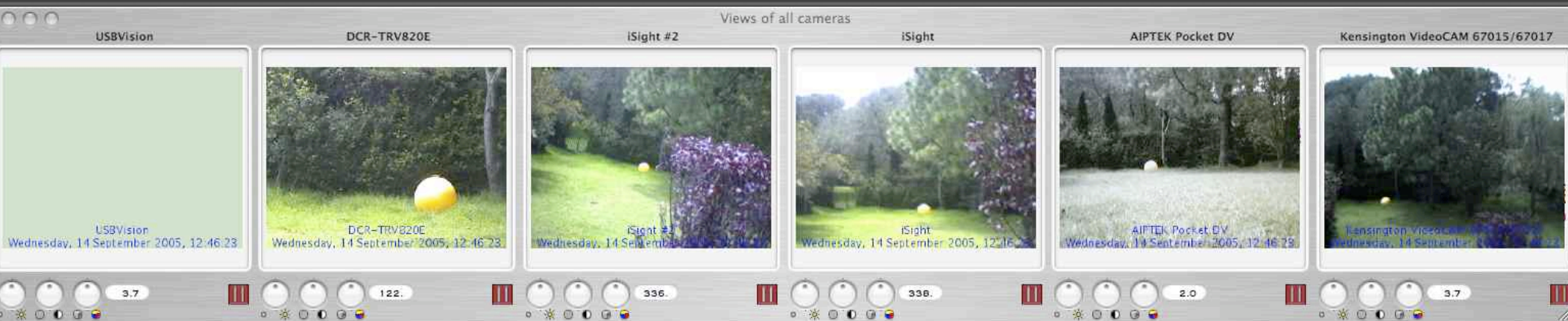
Below the main window are two smaller windows, each titled "GPS - /dev/cu.usbserial0" and "GPS - /dev/cu.USA19Q182273P1.1". Each window displays the following data:

Longitude: 77° 13.331' W Latitude: 38° 59.188' N Altitude: 88.7 m
Speed: 0.0 km/h 0.0 mp/h 0.0 knots
Deviation: 2.3 horizontal: 4.1 altitude: 7.7 Time: 25 sec.

At the bottom of the screenshot are two "GPS Satellites" windows, each showing a circular diagram representing the satellite constellation with numbered satellites (1, 4, 7, 10, 13, 17, 24, 30).

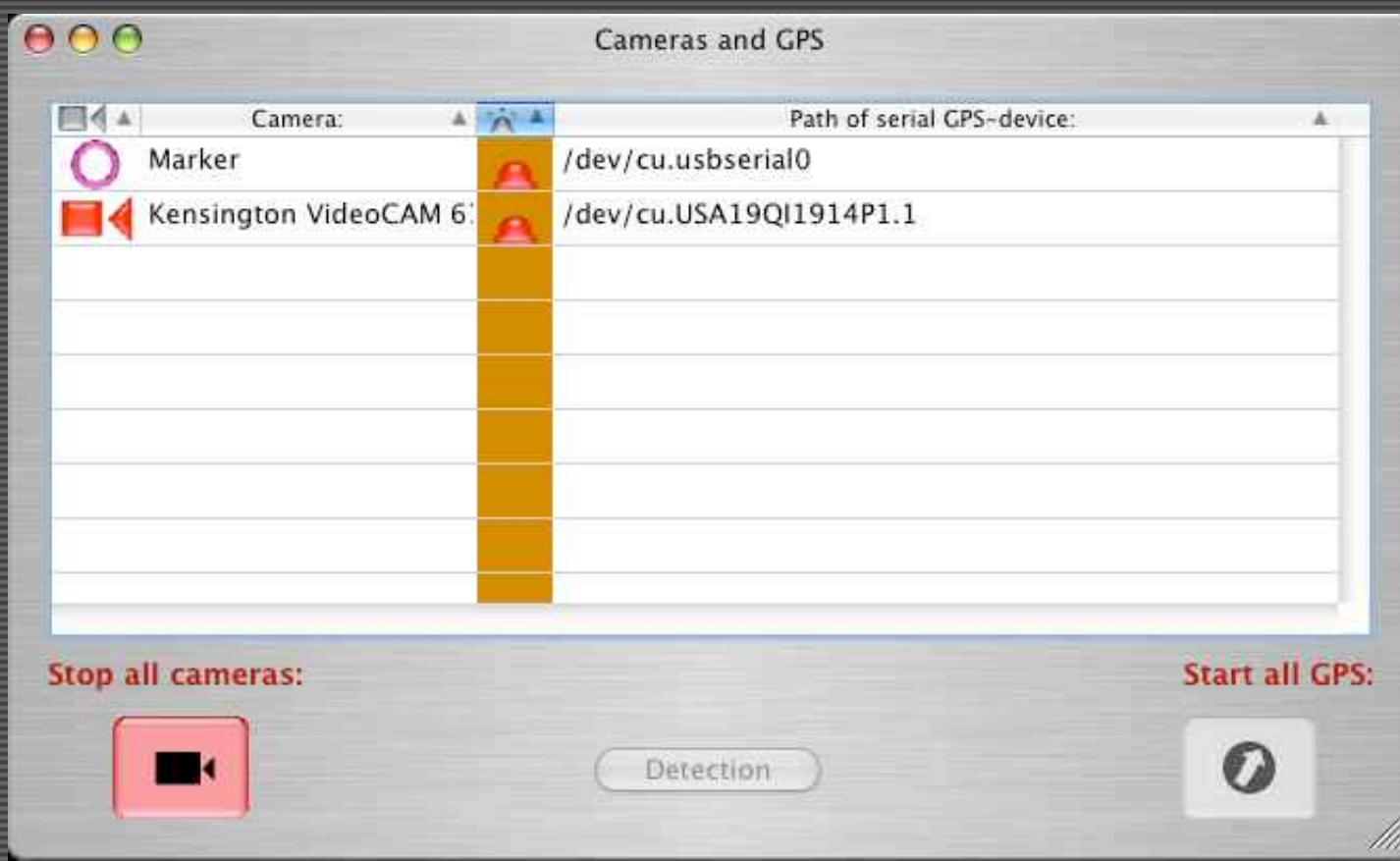
Cameras

Multiple cameras attached to the computer



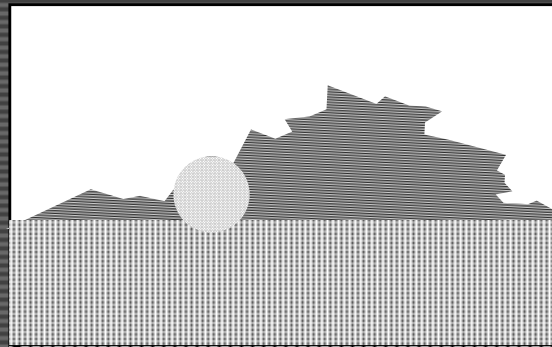
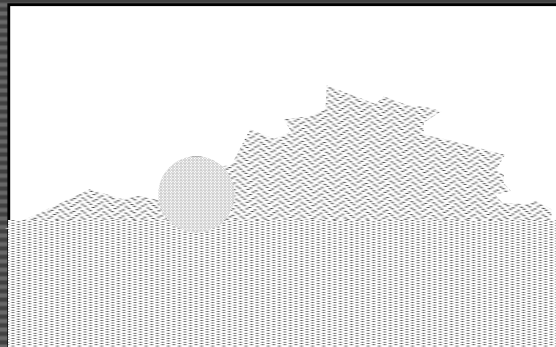
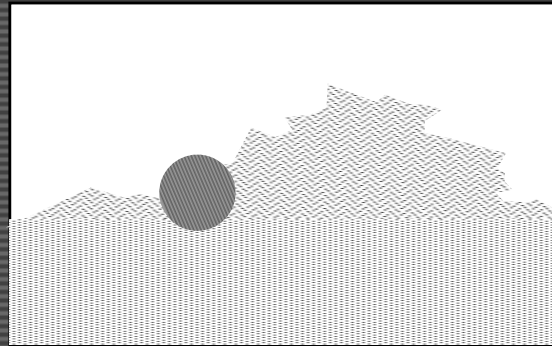
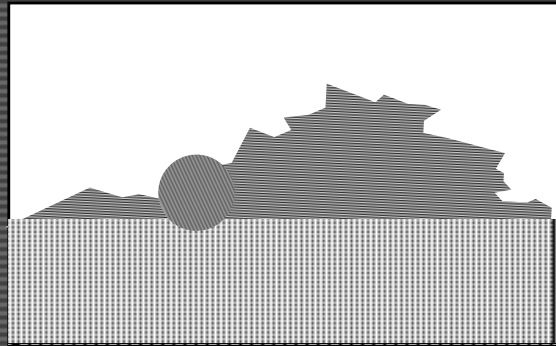
Device whrestling

Combining Cameras and GPS



Interface to combine cameras, GPS-devices and the marker. There is no method to associate the device automatically.

Choosing the Marker



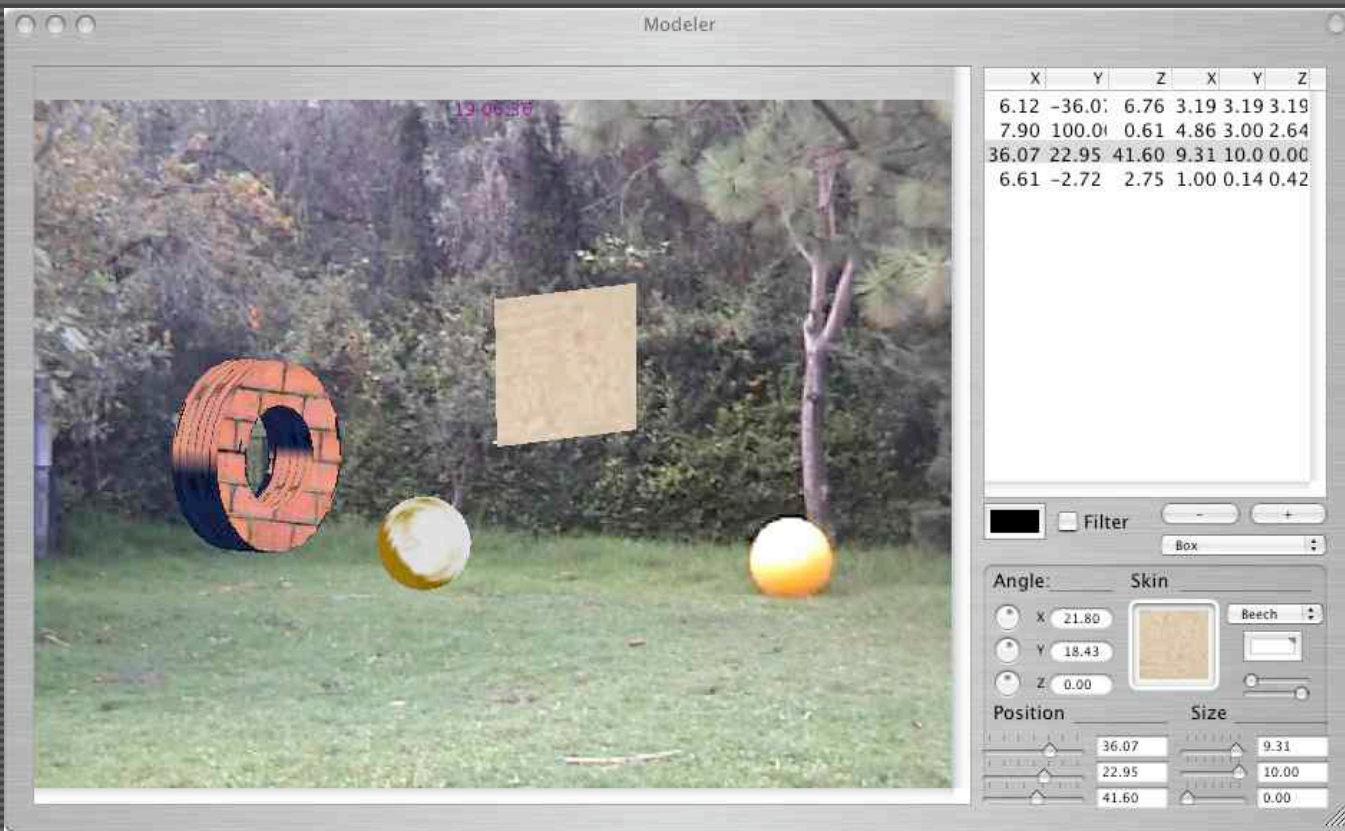
The color of the marker in relation to its background is one of the most important points of the system.

Detecting the Marker



Tresholding for b/w image, finding the area of interest, followed by Hough transformation, determine center and diameter in image-coordinates.

Interactive Modeler



Interface of the Interactive Modeler Simplified Interface to create and edit shapes in dimensions, position and orientation, color and texture, while the video is streaming in.

Detection



The red circle indicates the success of detecting the marker. With know position of both camera and marker the position and diameter are essential to calibrate the camera and to point the exact viewing direction

Overview



Screenshot with cameras, GPS, marker and laptop. On screen is the interactive modeler.

The marker is detected and the system is calibrated.

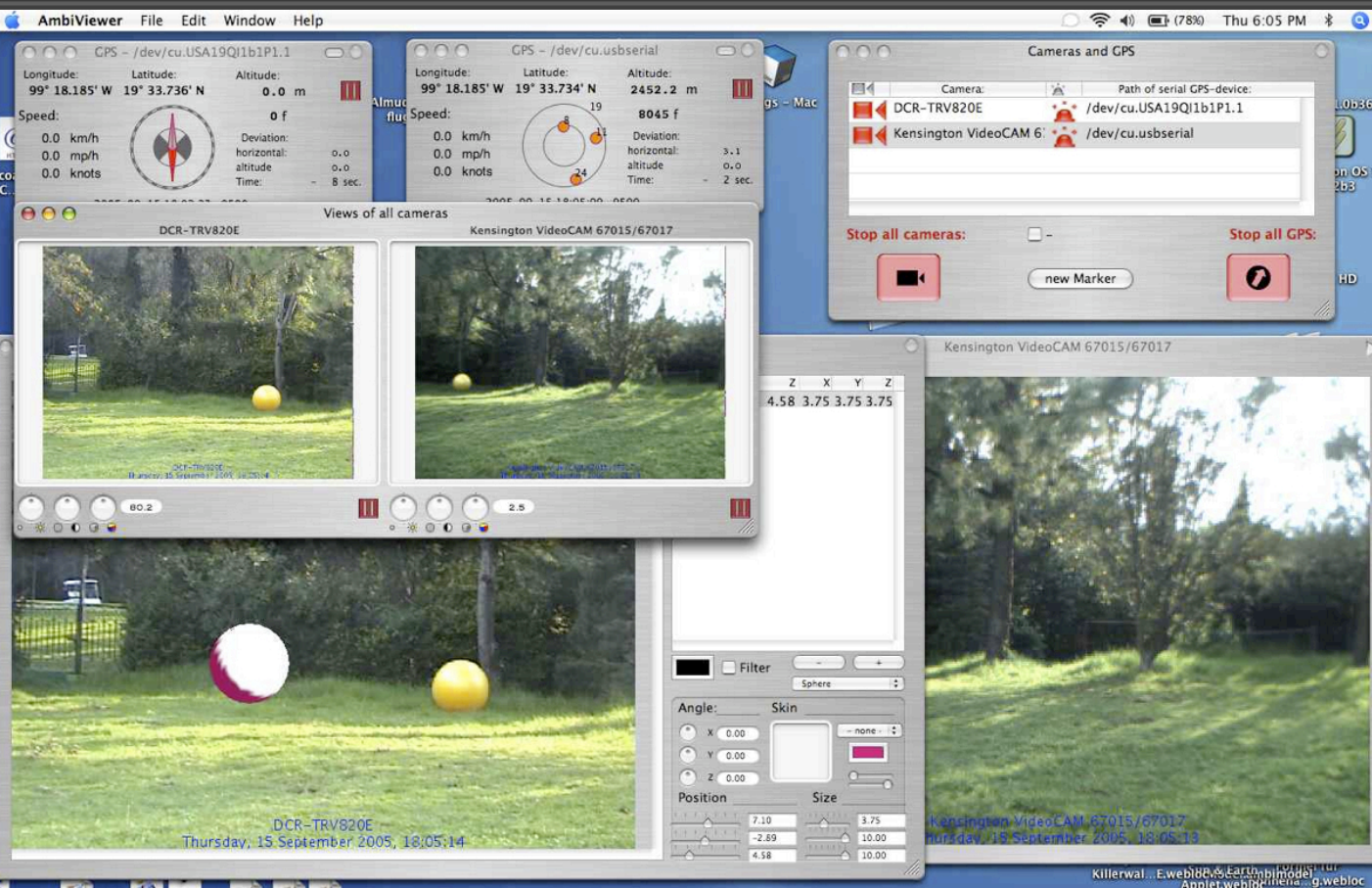
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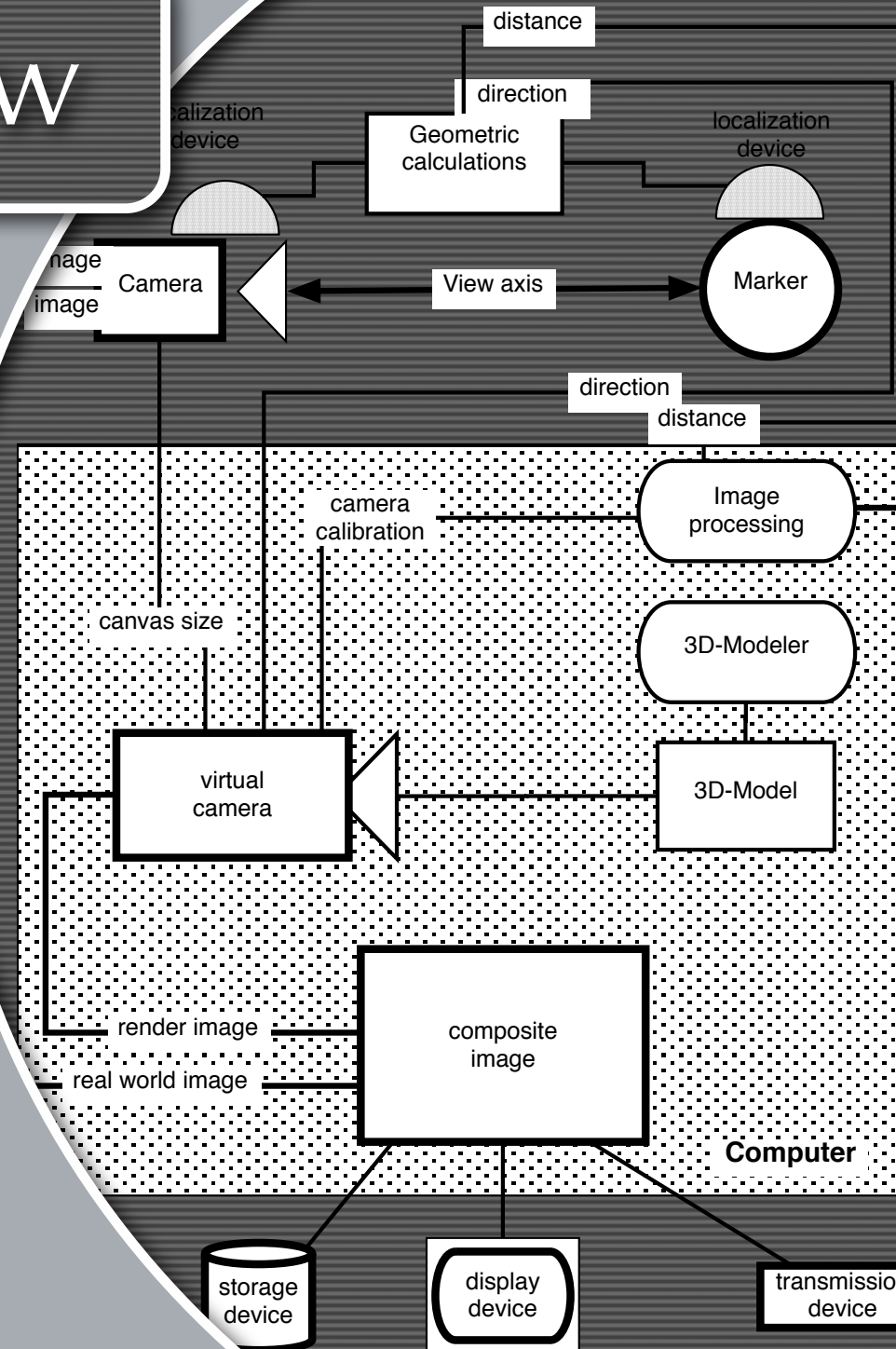
Summary

- Computer
 - Interactive Modeler
- GPS-Devices
- Camera(s)
- Marker

Technical Overview

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Examples

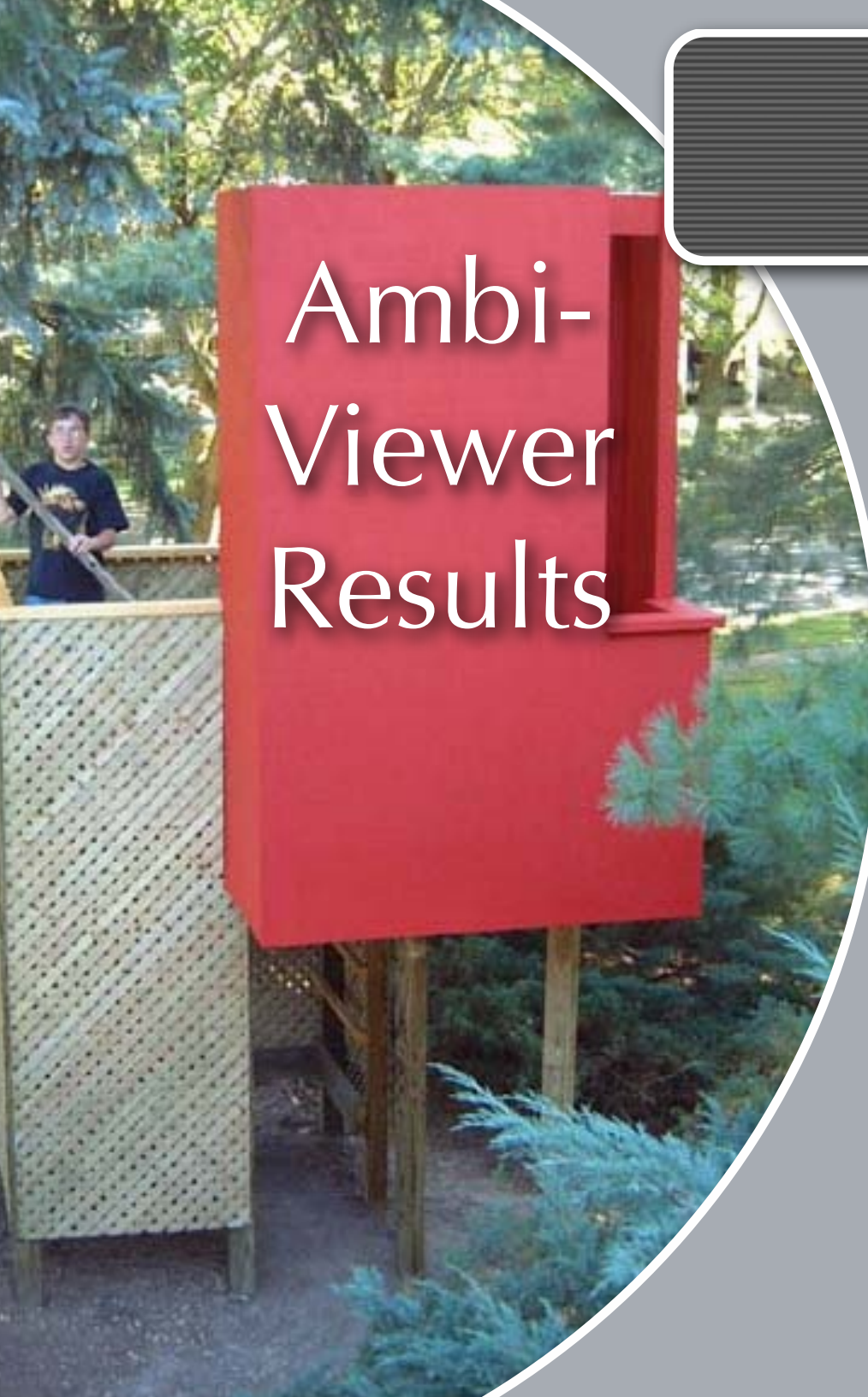
AmbiSpace

Examples

Ambi-Viewer Results

Working with the AmbiViewer - system demonstrates, that the combination of life-stream video, near real-time tracking and interactive modeling can provide results.

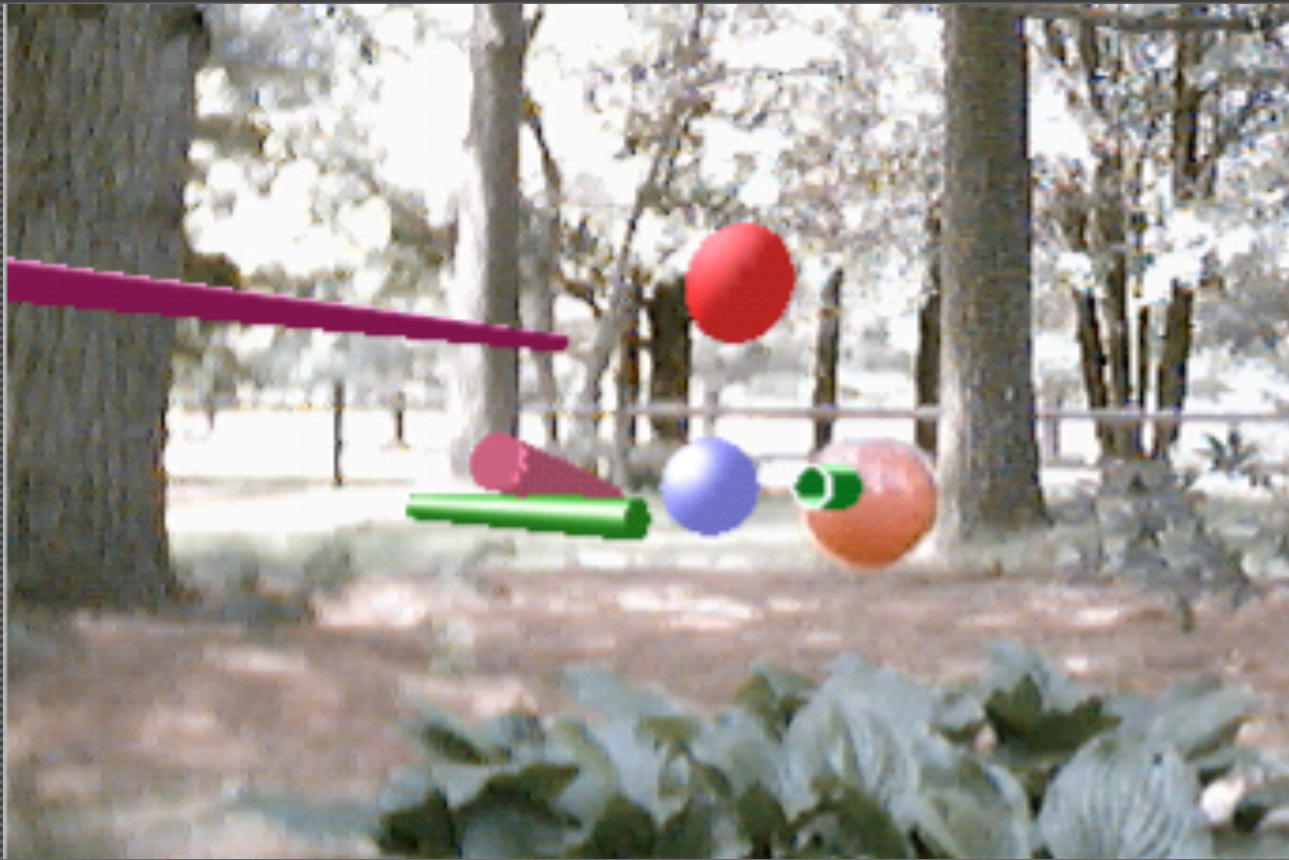
Examples

A photograph of a red signpost in a garden. The signpost is a large, rectangular red structure mounted on wooden posts. The text "Ambi-Viewer Results" is overlaid on the sign in white, sans-serif font. In the background, a person is visible behind a lattice fence, and there are various green plants and trees.

Ambi-
Viewer
Results

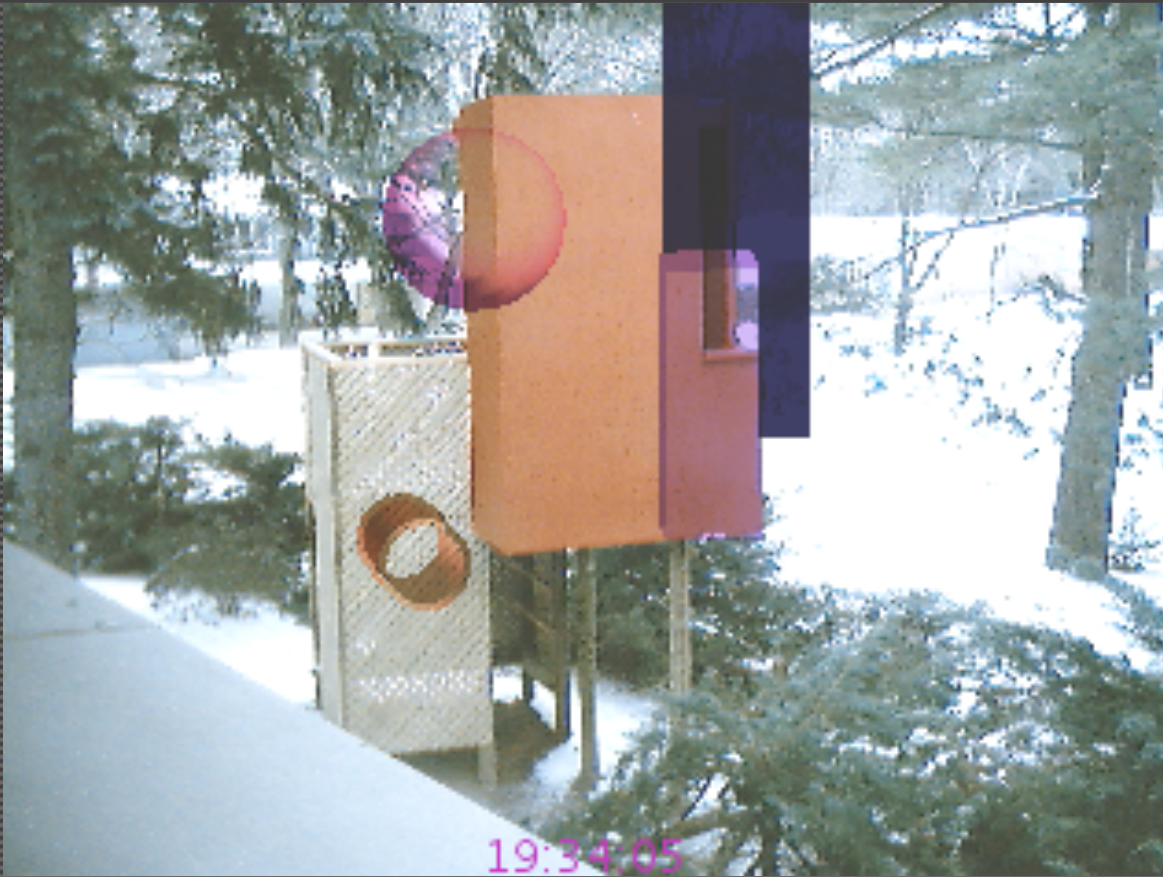
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Initial Sketch



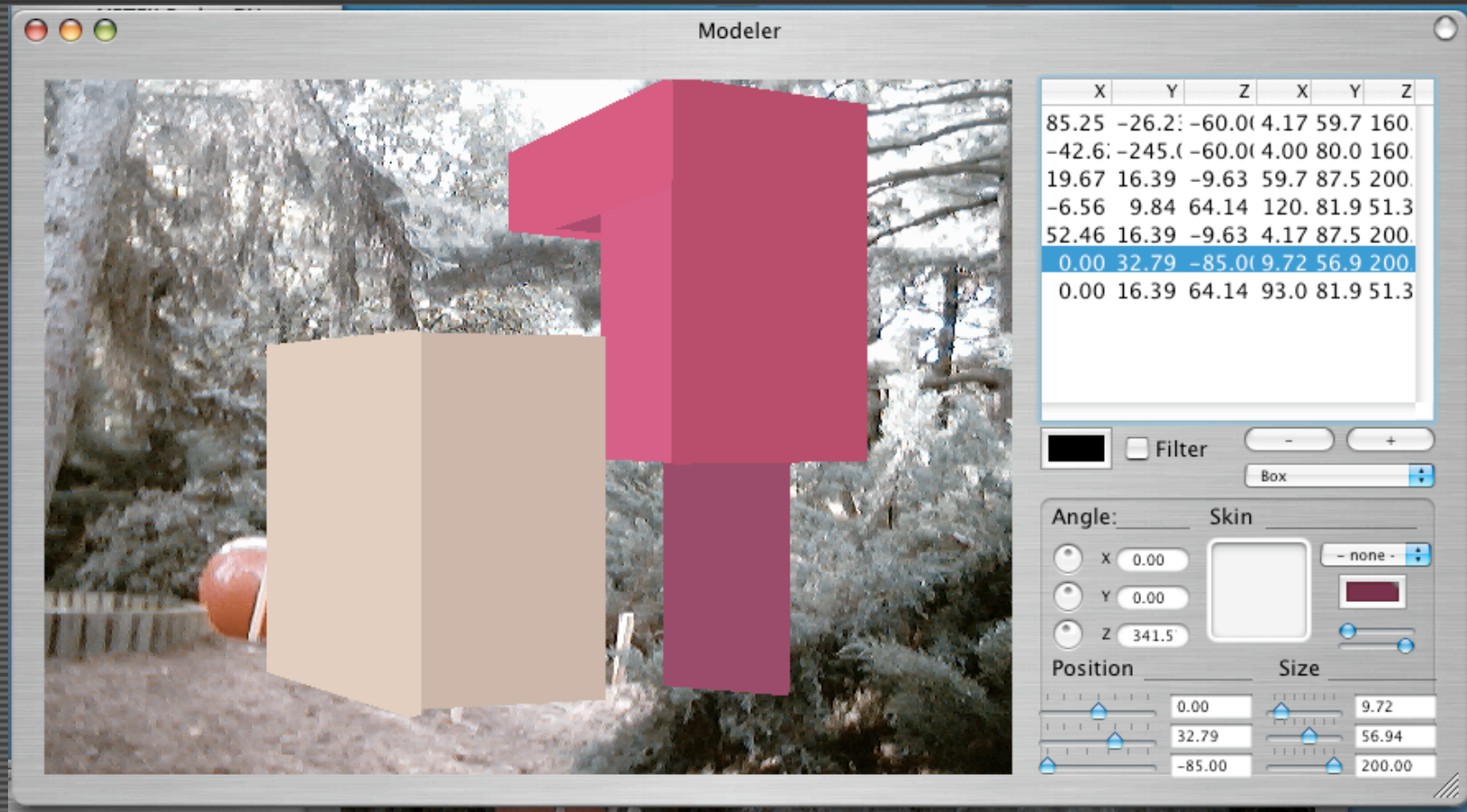
An initial sketch using AmbiViewer. The bottom ball is the marker, the rest of the balls, cylinders and hovering bars are simulations.

K-House by P. Anders



K-House with situated three-dimensional elements using AmbiViewer.

Interface of Interactive Modeler



Developing
the design of
the K-House

Peter Anders
used the
AmbiViewer.

Composite Image: Column

Column with stone texture.



Texture changed to marble.



Horizontal Position



Column moved upward.



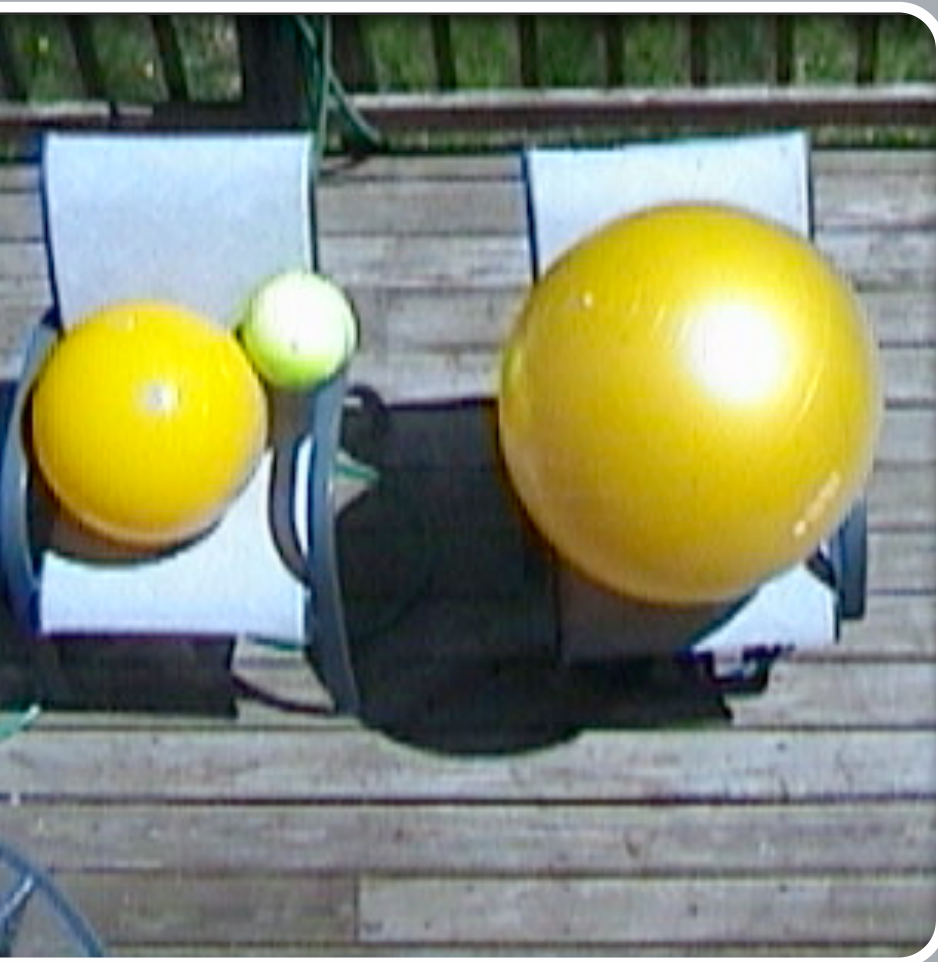
Transparency applied.

Do not forget...

In almost every example the marker can be seen in the final images.

They are essential parts of the system and always visible.

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Sensing

AmbiSpace



Architecture has a sensing and a creative part.

The quality of architecture does not depend on images and photorealistic drawings.

Sensing

AmbiSpace



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Reality

virtual Model



real-world Scene



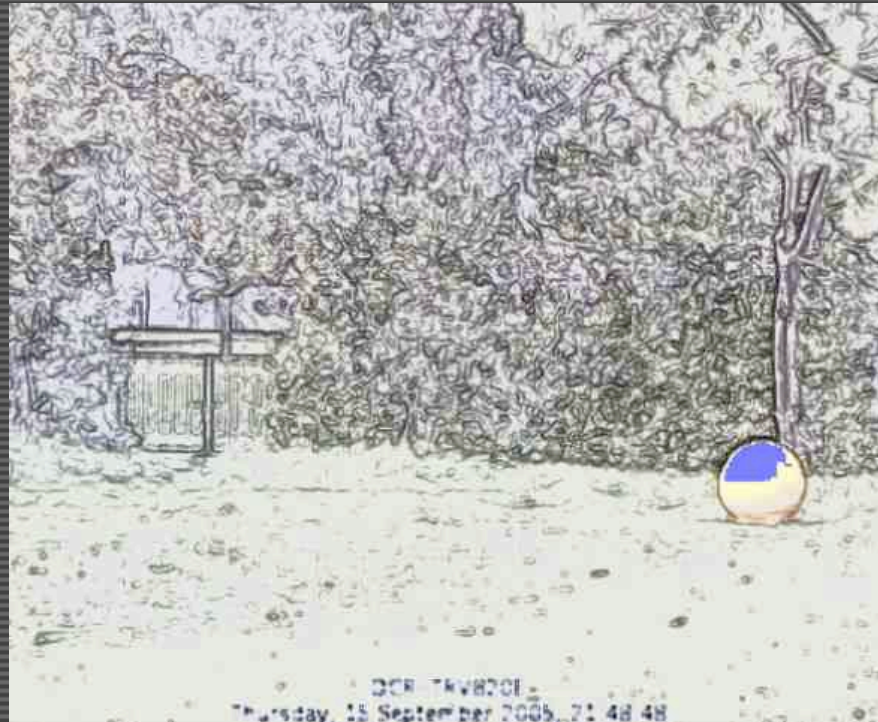
Composition

real Scene and virtual Model



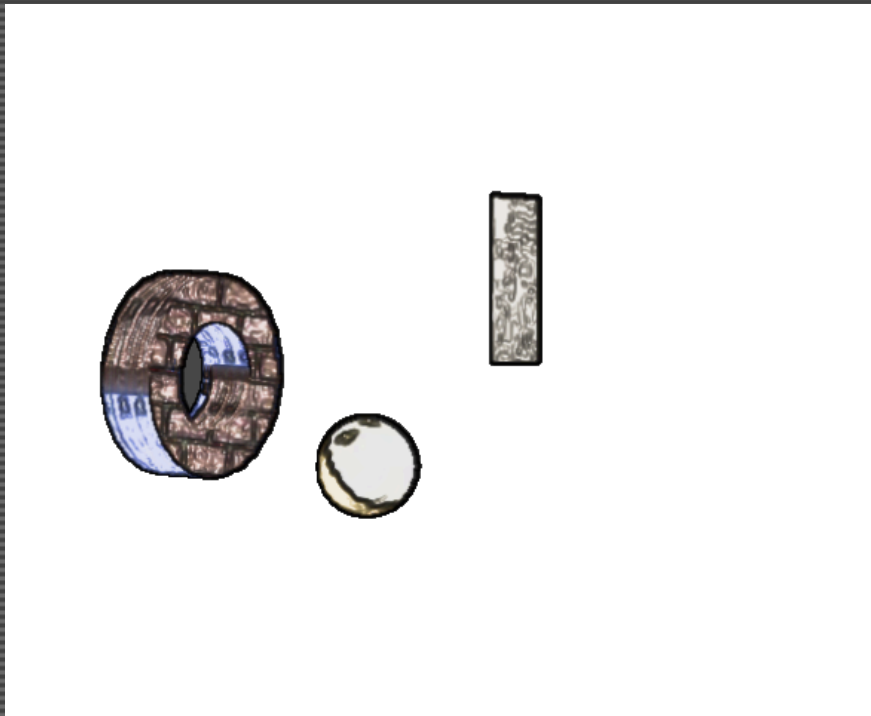
common case

reduced real Scene

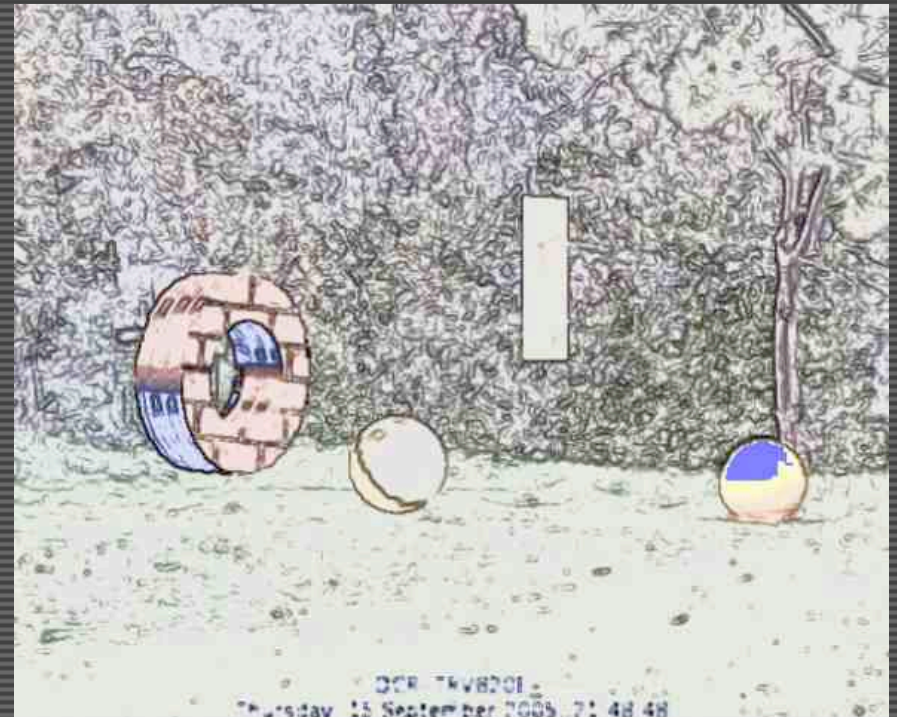


'unreal' composite Scene

virtual Model



Composition



'mixed' Scenes

virtual Model



real-world Scene



AmbiSpace

AmbiViewer

A Tool for viewing AmbiSpace



AmbiSpace



AmbiViewer

A Tool for viewing AmbiSpace

X	Y	Z	X	Y	Z
6.12	-36.07	6.76	3.19	3.19	3.19
7.90	100.00	0.61	4.86	3.00	2.64
36.07	22.95	41.60	9.31	10.00	0.00
6.61	-2.72	2.75	1.00	0.14	0.42

Filter Box

Angle: Skin

X 21.80 Y 18.43 Z 0.00

Position Size

36.07 9.31

22.95 10.00

41.60 0.00

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Thank
you.

