
X3D GPS Interface

Web3D Korea Chapter Meeting

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Mobile X3D Viewer with GPS

- Objective
 - Synchronize GPS with a 3D scene
 - Provide a 3D scene with real GPS location
 - Integrate a 3D scene or a 3D facility with GPS information
- Applications
 - Walk through simulation in a 3D scene with real GPS information
 - Real world facility and building management
 - Real world simulation in a virtual world

Real World GPS Information

GPS 1

GPS 4



GPS 2

GPS 3

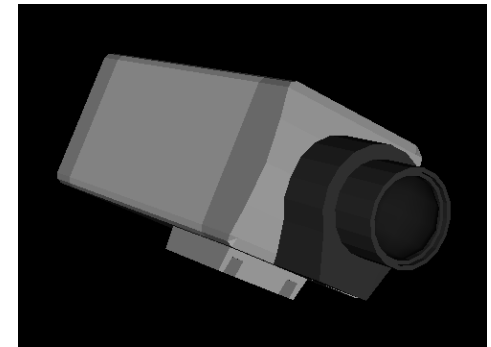
Real World Simulation with GPS



GPS + Virtual World = Real World Simulation



GPS Synchronization between Real and Virtual worlds



With GPS Data

GPS Synchronization with Real and Virtual worlds

A CCTV is inserted



GPS Synchronization with a 3D Scene

- Stationary 3D scenes
 - Provide with a range of GPS information
 - Synchronize fixed geospatial information with a 3D scene
- Movable 3D objects with GPS
 - 3D objects simulation with real GPS information in a 3D scene
 - Real world facility and building management



An interface positioning a 3D object in a correct real GPS location in a 3D scene

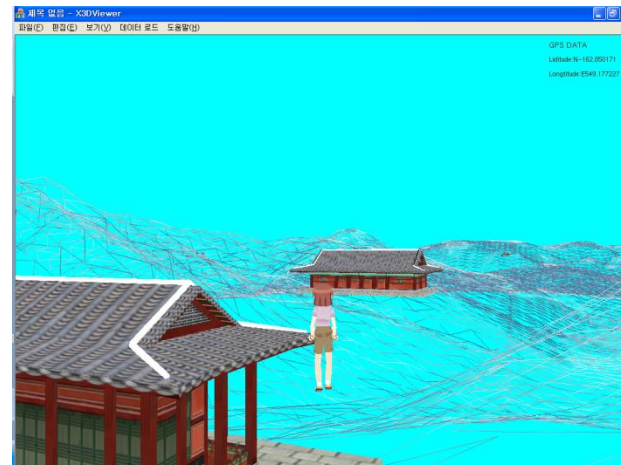
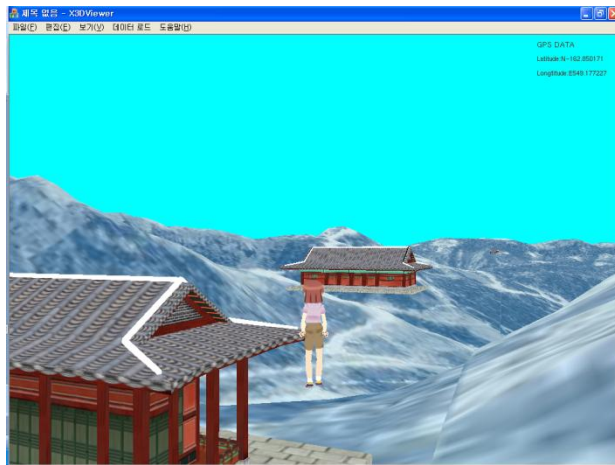
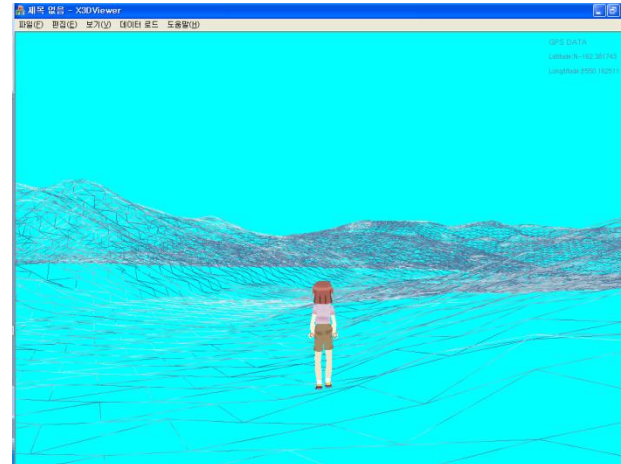
GPS component for X3D

- Proposal of a GPS component
 - To give real GPS information to a 3D scene
 - To synchronize a 3D scene with GPS information
 - Specification of GPS range in a 3D scene
 - Definition of GPS for stationary objects
 - Definition of GPS for movable objects
- Differences from the geospatial component
 - The GPS component does not use satellite images
 - The GPS component considers only 3D scenes and provides real locations for every object in a scene
 - The GPS component can define a specific location or a range of locations for a 3D object

Use of GPS Components

- General X3D scenes
 - A GPS component can define the real location of a 3D scene with the specification of a range of GPS information
 - A movable object can have its real location defined with the specification of specific GPS information
- Mobile X3D scenes
 - Represent a user's current position in an 3D scene

Real World Simulation with GPS



Mobile X3D Viewer Implementation

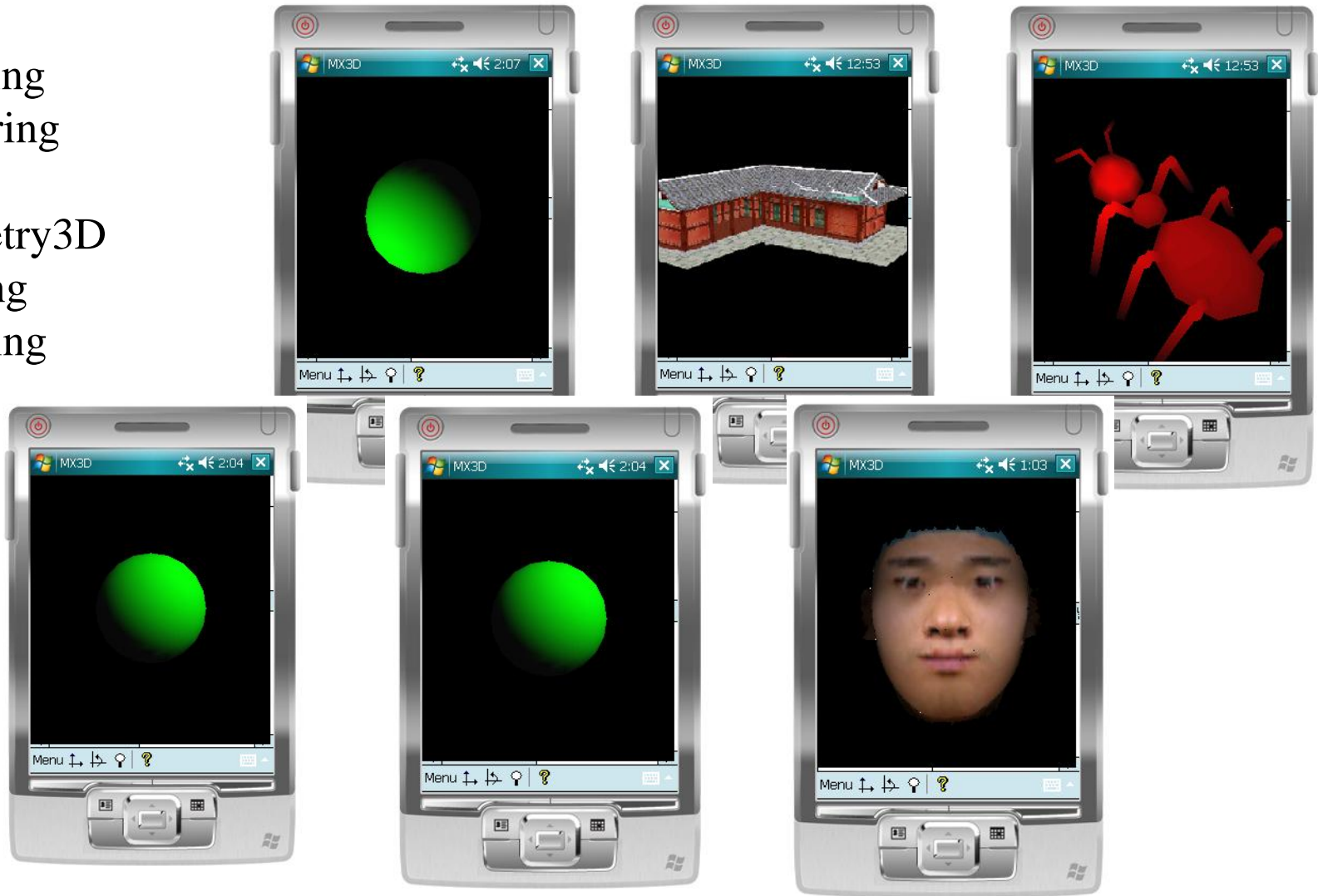
- Programming
 - Visual Studio 2005
 - Windows Mobile 6.0 SDK
 - OpenGL ES Vincent Library 1.0
- Mobile Device
 - Dell Axim X51V
 - Gigabyte GB-P100

Implementation Status of our Mobile Viewer

Component	status	Component	status
Core	○	Texturing	△
Time	X	Interpolation	X
Network	X	Pointing device sensor	X
Grouping	△	Key device sensor	X
Rendering	△	Environmental sensor	X
Shape	△	Navigation	X
Geometry3D	△	Environmental effects	X
Lighting	○	Event utilities	X
GPS interface	△		

Mobile X3D Viewer

Core
Grouping
Rendering
Shape
Geometry3D
Lighting
Texturing



Mobile X3D Viewer - Video



X3D GPS component - Video



Conclusion

- Proposal of a GPS component for X3D
 - Specification of GPS information in an X3D scene or an X3D object
 - Synchronization of an X3D scene and GPS information
 - Current GPS location and GPS range in an X3D scene
 - GPS definition for stationary and movable objects in an X3D scene