VirtualLife
The evolution of 3d virtual worlds

VirtualLife is an experimental and innovative framework containing advanced tools and options for creating virtual world applications. VirtualLife is not a virtual world, nor a stand-alone application, it is a scalable and customizable platform containing some basic modules and based on some fundamental innovative pillars (peer-to-peer architecture, expandable scripting language, virtual constitution, secure communication infrastructure); thanks to its extreme flexibility, additional modules can be built on top of it on demand.

Definition of Virtual World

A virtual world is defined as an online community set in a computer-based simulated environment in which users can interact with one another through a digital representation (avatar) of themselves.

Context

In recent years virtual worlds have blossomed in terms of numbers, digital population, fields of applications, interests involved, economical transactions. Most of them have been created and are actually used for entertaining and socialization purposes, but for their characteristics (interactivity, real time, persistence, multimedia richness...) virtual worlds are also becoming more and more attracting for business and educational applications. Starting from a deep analysis of the competitors' landscape, the VirtualLife Consortium focused its research on the development of some specific features to make virtual worlds suitable for professional uses.

VirtualLife main features

VirtualLife is based on some specific features that ensure the creation of a rich, secure, trusted, democratic and legally ruled collaboration environment particularly suitable for industrial, training, educational, cultural and business scenarios.

P2P architecture

VirtualLife architecture is based on three main components (client module, zone server module, nation server module). Each module represents a node within a peer-to-peer network.

The p2p approach is applied to the networking library, the virtual reality engine and the scripting.

This kind of approach allows load-balancing among peers, robustness and reliability of the virtual world and the creation of rich 3d worlds at reduced server costs.

Strong identity

In VirtualLife users can have a strong identity; this is ensured by means of X. 509 compliant certificates and locally stored keypair (ssh approach to authentication)

The concept of strong identity is at the basis of the secure communication module (as it allows strong encryption in streams, private chats, contracts and e-sognature) and also of the legal and social framework (as it can make avatar legally liable for their own actions)


Advanced scripting

Thanks to the availibility of a sophisticated scripting engine, VirtualLife users can create complex animated and/or interactive objects, customize the client GUI, define aspects of the virtual constitution and develop complex applications.

The VirtualLife Scripting Engine has the following characteristics:

− the scripting language is based on LUA and a dedicated library has been added to provide a

natural binding with the VL framework

    – the Virtual Machine has been sandboxed

    – the engine supports concurrency, persistency and distributed scripting (see also p2p)

    – interactivity is achieved thanks to a complete event model
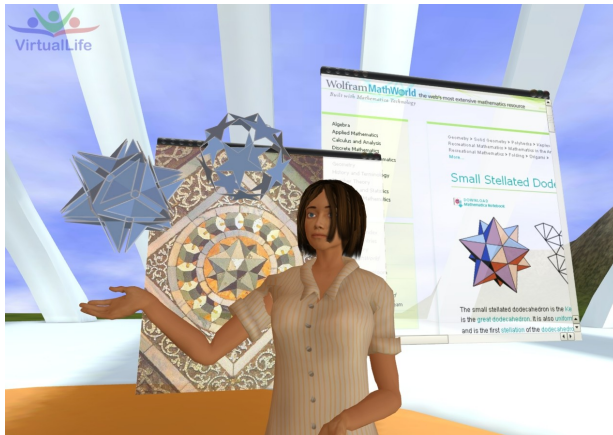
Legal and social cooperation framework

the legal and social cooperation framework is one of the most innovative features of the platform with respect to already existing virtual worlds.

The legal framework consists of a supreme constitution and a virtual nation constitution that regulate the behaviour of users who populate the zones registered to that nation.

Administrators are able to change the constitution through the law editor.

All kinds of users can stipulate contracts, resolve online disputes and participate to referenda through an e-voting system.

The user can take advantage of all these features thanks to the strong duality that exists between real and virtual identity.

The strong identity aspect is also at the basis of common social features such as chats, groups, friendship and reputation.

System Requirements

Operating System: Windows XP/Vista/7 (32/64); Linux (32/64)

CPU: Minimum 1.2GHz (older RISC based MACs not supported)

**RAM:** Minimum 1Gb (performance will vary depending on your operating system)

Graphics Card: Minimum Nvidia/ATI/Intel card with pixel shader and vertex shader support. Your VLClient will produce an error message and exit if you do not have the needed level of graphics hardware. From the Ogre web-page:

    Nvidia: Geforce2 or higher required, Geforce4(non-mx) or higher recommended.

   ATI: Radeon 7500 or higher required, Radeon 9600 or higher recommended.

Network: Internet connection of upload/download at minimum ADSL capacity - at least 500kbps upload and 500kbps download capacity. Problems may occur if:

    You are connected to an intranet, with a router that is not enabled for NAT punchthrough. Contact your network administrator for more advice on this problem.

    You are connected to the internet using an ADSL box that is not enabled for NAT punchthrough. Contact your service provider for more support.
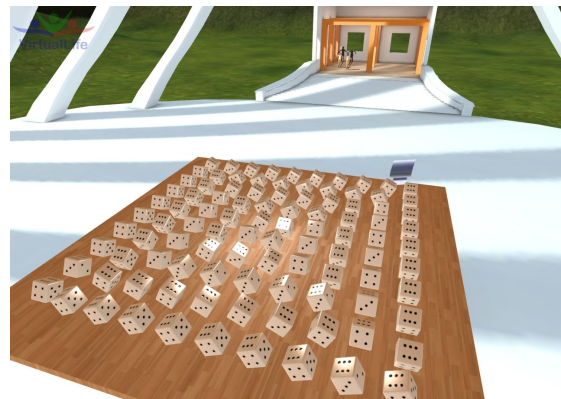
The VirtualLife framework has been developed under the project
VirtualLife
Secure, Trusted and Legally Ruled Collaboration Environment in VirtualLife
www.ict-virtuallife.eu
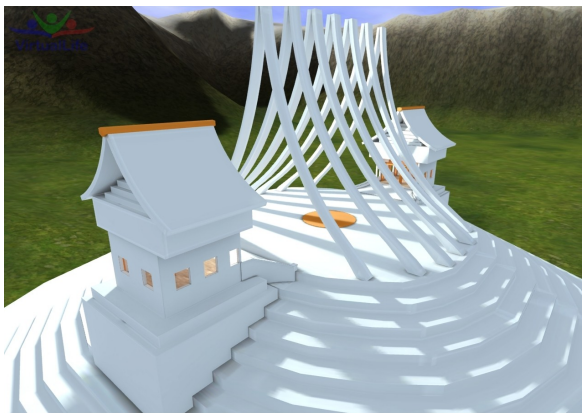
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Goettingen University (germany)
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Deep Blue Srl (Italy)
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Duration: 43 months
Timetable: January 2008 - July 2011
Total budget: 3,29 million euro
EC funding: 2,46 million euro
Instrument: STREP
Project identifier: FP7-216064