# Virtual Hang-gliding over Rio de Janeiro

Luciano P. Soares lsoares@lsi.usp.br
Leonardo Nomura nomura@lsi.usp.br
Marcio C. Cabral mcabral@lsi.usp.br
Mario Nagamura nagamura@lsi.usp.br
Roseli D. Lopes roseli@lsi.usp.br
Marcelo K. Zuffo mkzuffo@lsi.usp.br
Laboratório de Sistemas Integráveis
Departamento de Engenharia de Sistemas Eletrônicos
Escola Politécnica da Universidade de São Paulo

## Abstract

Hang-gliding is a very enjoyable sport, provided in many tourist places. But many people are still afraid to fly in such system or unable to travel to Rio de Janeiro. Using virtual reality we developed a virtual tour over Rio de Janeiro. In this system the user can see the city and its beautiful sights from a different perspective providing a safe and fun environment where people can experience a truly immersive hang-gliding flight. By easing fear and eliminating the risks, the experience is enhanced. It could cure problems caused by lack of self-confidence and can also be used for training as well. This solution could even encourage people to try a real hang-gliding experience.

This virtual tour is composed by a real hang-gliding structure of about 9 square meters where the user can rest on a hang strap. The control is a modified joystick connected to the glider's frame. For user visualization we are using a HMD which supports stereoscopic vision and audio stereo with head tracking. The wind sensation is created by a fan positioned in front of the user. The wind speed is controlled according to the user interaction with the system.

**CR Categories**: I.3.7 [Computer Graphics]: Three-Dimensional Graphics and Realism – Virtual reality; I.3.2 [Computer Graphics]: Graphics Systems – Distributed/networks graphics

**Keywords**: X3D, Cluster Computing

## 1 Development

The model of Rio de Janeiro was created as part of a project for a tourism exhibition. It was created with Alias|wavefront Maya. The model is saved in VRML and then converted to X3D, see Figure 1. An avatar of the glider is also rendered because the user is wearing a HMD and can not see the real one. The sound simulation has background music, and some points in the environment have sounds, like in Maracanã, and Sambódromo.

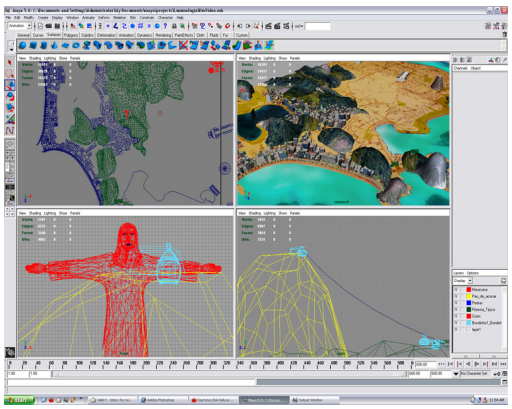

Figure 1- Maya tool editing Rio de Janeiro

## 2 Operation

The tool used to visualize is Jinx [Soares and Zuffo 2004]. Jinx is a tool developed internally. It is a 3D browser and supports X3D files. Jinx was projected to support commodity cluster, then each computer is responsible for some specific tasks. It supports stereoscopic graphics and 3D sound, besides other possible expansions.

The Figure 2 shows a user interacting with the solution and the images that are been seeing by him.

Figure 2 – Hang-glider images and uses

There is a clock at the upper right corner, which is used to control the time the user can stay at the glider. He can see the time decreasing during the flight, and also hear a sound alarm. See, Figure 3.

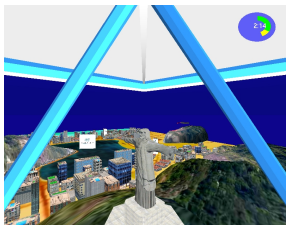

Figure 3 - Hang-gliding image

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## References

SOARES, L., AND ZUFFO, M. 2004. JINX: an X3D browser for immersive simulation based on cluster of commodity computers. In *Proceedings of the ninth international conference on 3D Web technology*, ACM Press, New York, ACM, 79–86.