Special Issue from the Ibero-American Symposium in Computer Graphics (SIACG)

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The purpose of the Ibero-American Symposium in Computer Graphics (SIACG) is to promote the international cooperation between researchers and professionals in Computer Graphics from the different communities of the Iberian Peninsula and Latin America. This symposium was the fifth of similar events organized every other year and alternating between Europe and South America.

This symposium brings together the latest research results on a wide range of topics, from animation to rendering, computational photography or virtual reality. In addition it provides a place to communicate new results, exchange experiences, foster interaction and discussion, and can help define new productive directions for research and applications.

For the first time, we dedicate a special issue of the *International Journal of Creative Interfaces and Computer Graphics* to this event, celebrating the fifth event of this Symposium. The issue illustrates the spectrum of papers that are typically selected and presented during the SIACG event and make it a success.

PAPERS IN THIS ISSUE

In this special issue, we have gathered five contributions that offer a typical overview of research topics at the core of the V Ibero-American Symposium in Computer Graphics -SIACG 2011, ranging from computer aided orthopedic surgery, face and object recognition, collision detection, to geometric interpretation of speech sounds.

The first paper explores implant deformation on digital preoperative planning of lower extremities fractures. The authors propose a new method for the deformation of implants in Computer Aided Orthopedic Surgery systems, based on the Moving Least Squares (MLS) method. Over 100 clinical surgeries have been already planned successfully with their proposed technique in Radiology Department of the University Hospital of Caracas.

The second paper studies the problem of volume-surface collision detection. The authors introduce the problem of collision detection between volume datasets and polygonal meshes.

This kind of scenarios appears naturally in many applications such as surgery simulation and volume editing. In this work the collision detection is performed in image space, where the mesh is texturized with the volume itself to detect collisions in the GPU.

The third paper evaluates the feasibility of using a mesh comparison tool in the study of European Portuguese speech sounds. The authors propose an approach to analyze and compare tongue shape, providing a qualitative measure enabling further insight into the main differences between speech sounds. For that, the authors used a MRI database, which enables the tongue segmentation and the mesh creation to assess differences between different sounds, syllabic positions and speakers.

The fourth paper describes a framework for cortical 3D face and object recognition using 2D projections. The authors show that with five 2D views and their cortical representation it is possible to determine the left-right and front-lateral-profile views. Such framework follows a bio-inspired face-recognition model that was tested for face recognition but also for object recognition where the tests are reported.

Finally, the last paper presents a work to simulate interaction with elastic materials. The authors propose a technique to interactively deform 3D images, such as those acquired by a CT scanner. The volume is treated as an elastic, isotropic medium. Force feedback is computed following continuum mechanics principles, which leads to a natural and plausible tactile sensation. Besides, it is possible to deform complex structures at high frame rates, independently of the size of the volume, using a free form deformation structure as a wrapper.

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