

# Improved Algorithms for Volume Rendering and Mesh Processing

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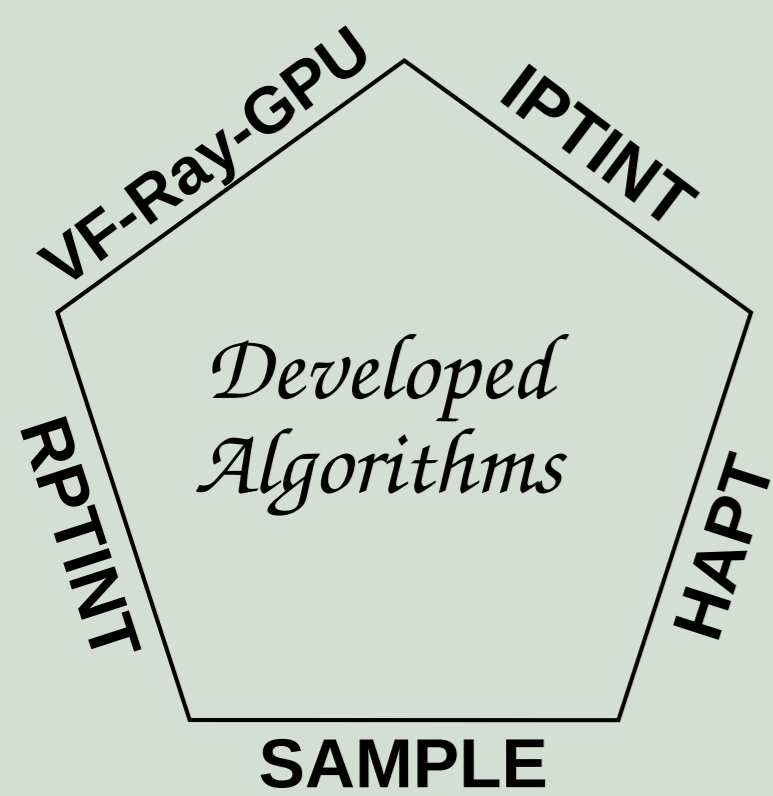
LCG / PESC / COPPE / UFRJ -- Brazil

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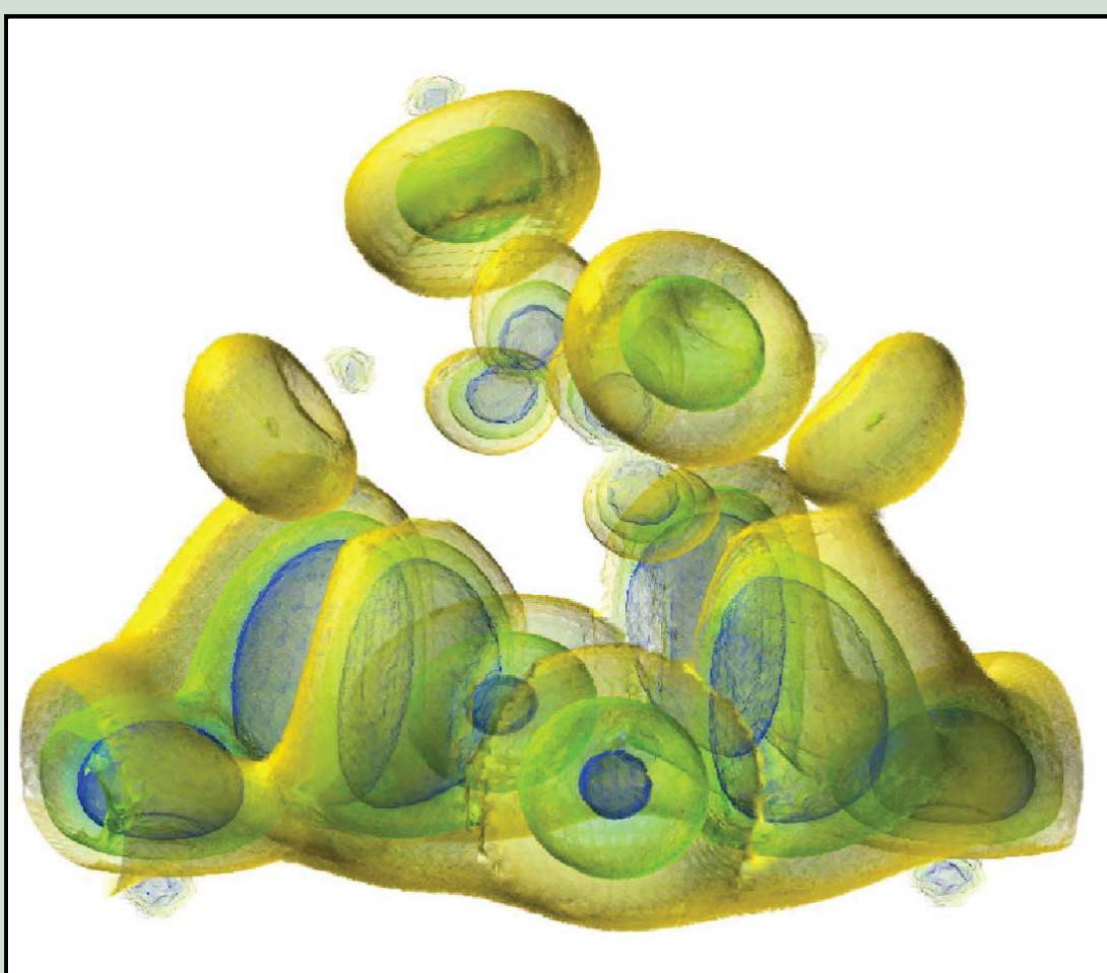
Ricardo Farias [rfarias@cos.ufrj.br]

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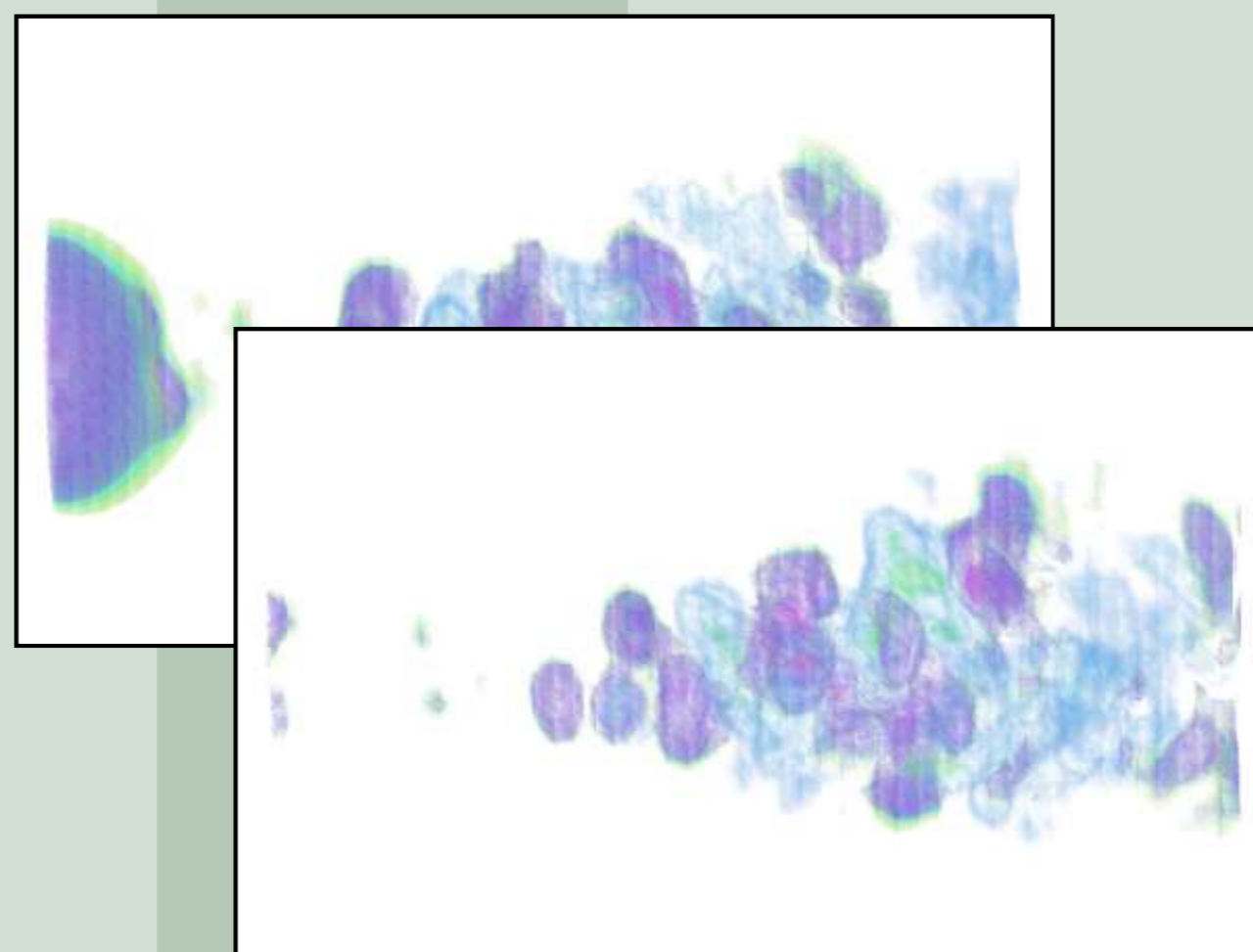


## Volume Rendering

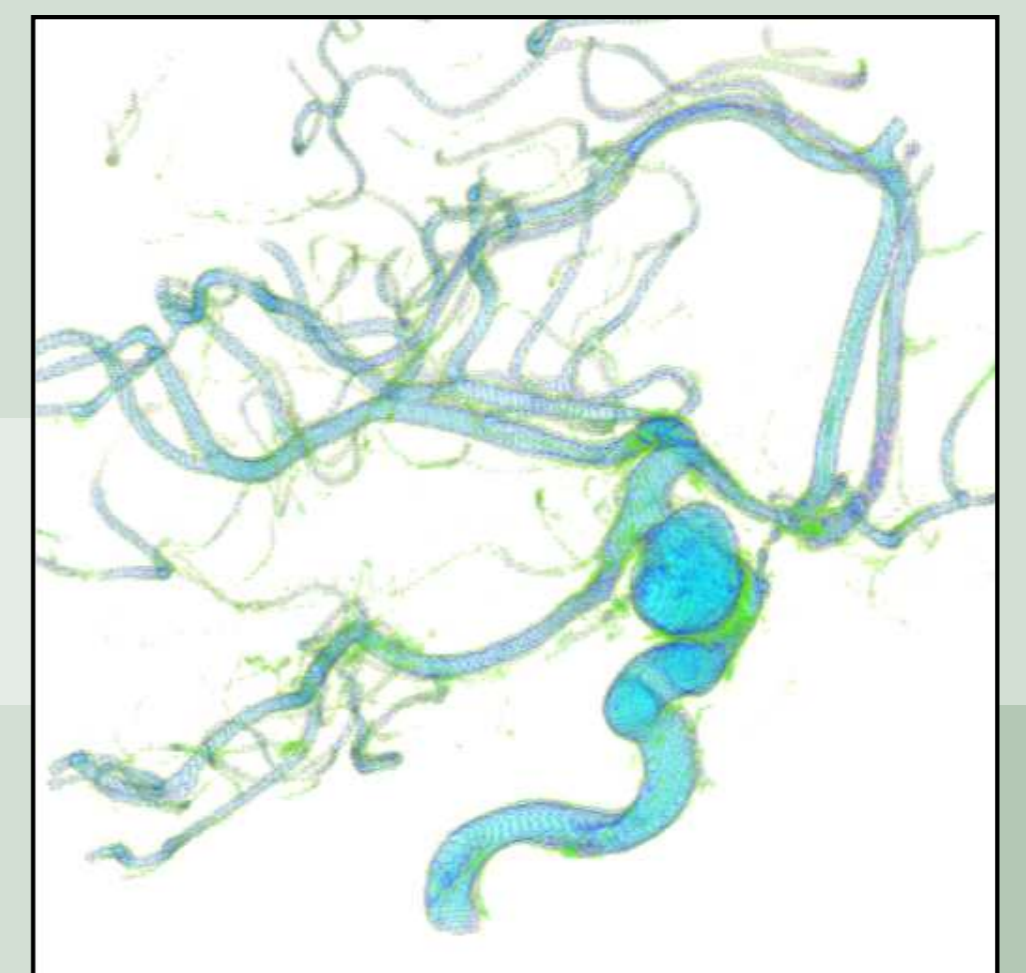
- \_ Memory Efficiency
- \_ Improved Performance
- \_ Flexible Framework
- \_ Using GPUs



Hybrid Volume Rendering



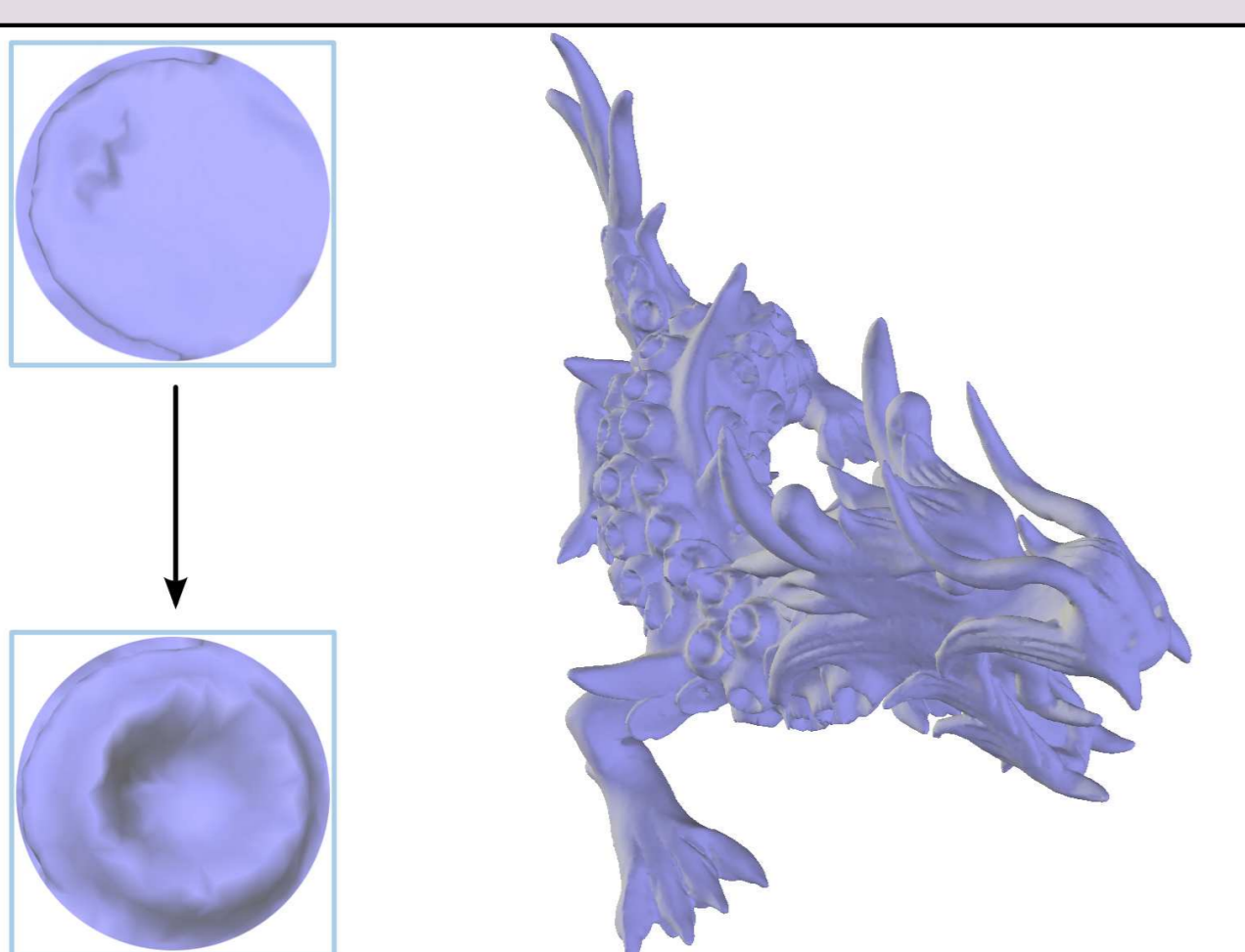
Time-Varying Rendering



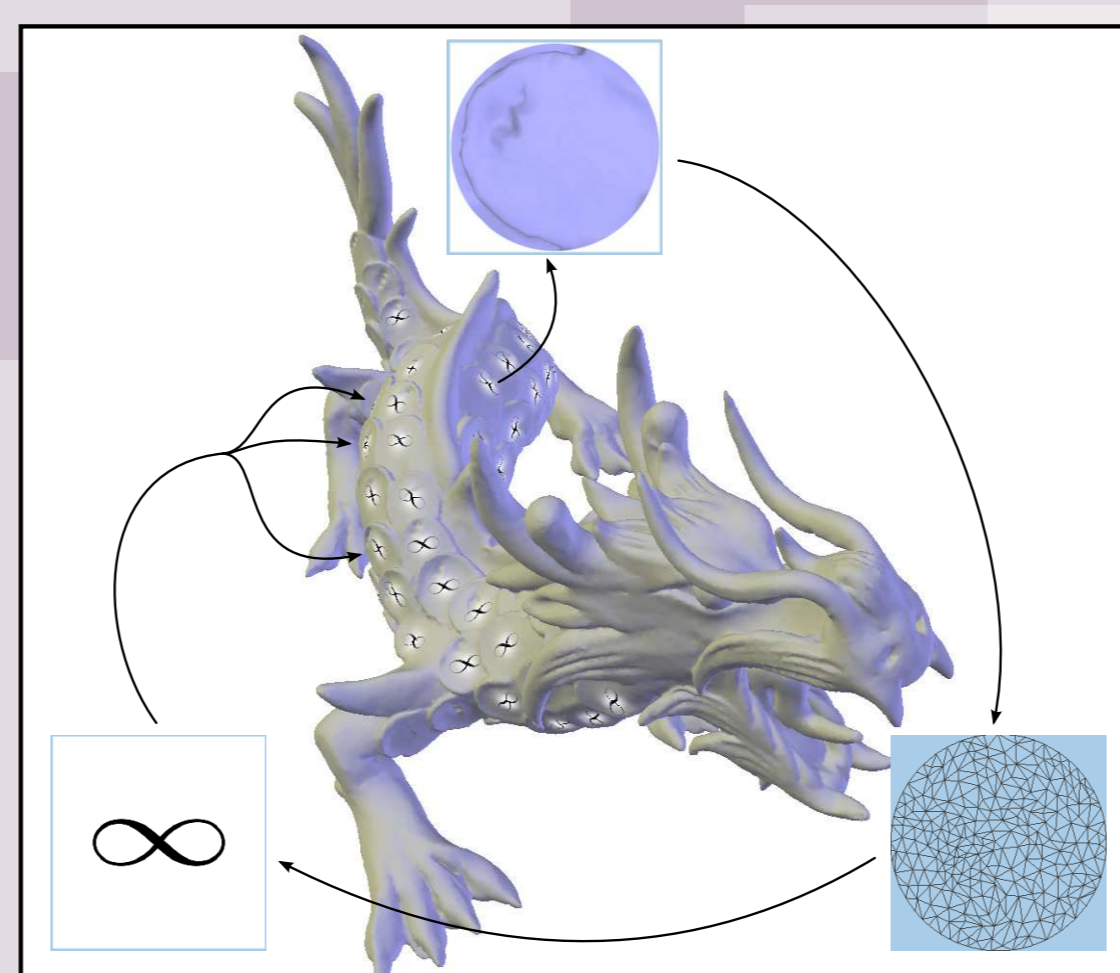
Regular Data Specialization

## Mesh Processing

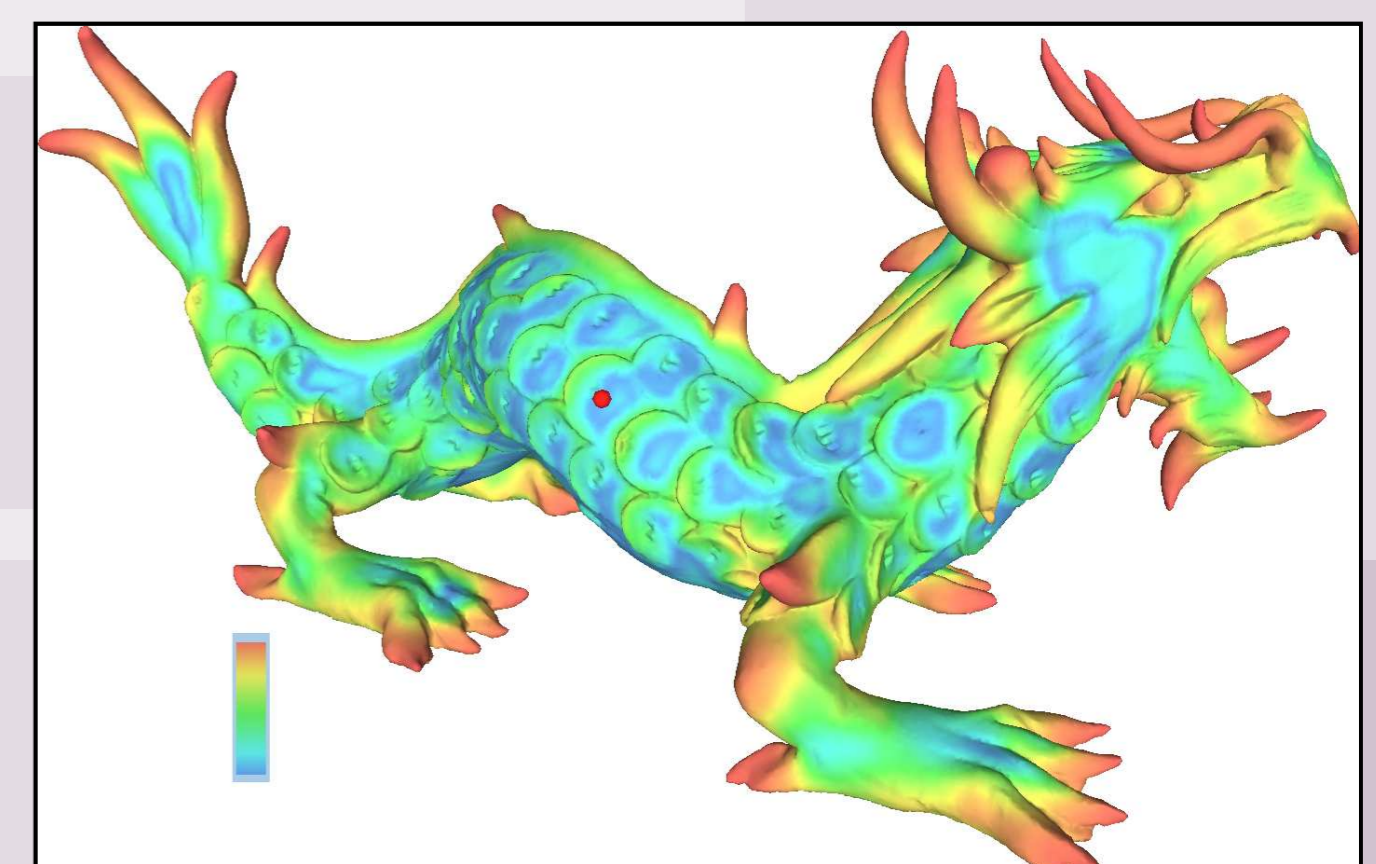
- \_ Heightmap Descriptor
- \_ Rotationally Invariant
- \_ Region-based Comparison
- \_ Processing Propagation



Mesh Parameterization



Detail Transfer



Feature Space

VF-Ray-GPU	MAXIMO, A., RIBEIRO, S., BENTES, C., OLIVEIRA, A., FARIAS, R. "Memory-Efficient GPU-Based Ray Casting for Unstructured Volume Rendering", in <i>Proceedings of VG-PBG (Eurographics Association)</i> , pp. 155-162, Los Angeles, California, USA, 2008.
RPTINT	MAXIMO, A., MARROQUIM, R., FARIAS, R., ESPERANÇA, C. "GPU-Based Cell Projection for Large Structured Datasets", in <i>Proceedings of GRAPP (INSTICC)</i> , pp. 312-322, Barcelona, Spain, 2007.
IPTINT	MARROQUIM, R., MAXIMO, A., FARIAS, R., ESPERANÇA, C. "Volume and Isosurface Rendering with GPU-Accelerated Cell Projection", in <i>Computer Graphics Forum (Best Paper selection of SIBGRAPI 2006)</i> , v. 27, pp. 24-35, 2008.
HAPT	MAXIMO, A., MARROQUIM, R., FARIAS, R. "Hardware-Assisted Projected Tetrahedra", in <i>Proceedings of Eurographics/IEEE Symposium on Visualization (Computer Graphics Forum special issue)</i> , v. 29, pp. 903-912, Bordeaux, France, 2010.
SAMPLE	MAXIMO, A., PATRO, R., VARSHNEY, A., FARIAS, R. "A Robust and Rotationally Invariant Local Surface Descriptor with Applications to Non-local Mesh Processing", <i>Elsevier Graphical Models (to appear)</i> , 2010.

*Publications*