

# Real-Time Massive 3D Data Capture and Geometry Processing

Gabriel Taubin  
Brown University  
USA

## ABSTRACT

In Geometry Processing, a field which has developed during the last ten years, concepts from applied mathematics, computer science, and engineering are used to design efficient algorithms for the acquisition, manipulation, animation and transmission of complex 3D models. A number of methods have been proposed to smooth, denoise, edit, compress, transmit, re-parameterize, and animate very large polygon meshes, based on topological and combinatorial methods, signal processing techniques, constrained energy minimization, and the solution of partial differential equations. In particular, polygon models, which are used in most graphics applications, require considerable amounts of storage, even when they only approximate precise shapes with limited accuracy, and must be compressed by several orders of magnitude for fast network access. In this talk I will present some of our early contributions to the field, and some related ongoing research projects. I will also describe the state of our work towards the apparently unrelated goal of building Visual Sensor Networks with 1000s of cameras for real time capture and processing of 3D data.