KEYNOTE TALK

ISVC 2018: International Symposium on Visual Computing
Las Vegas, NV, USA

Wednesday, November 21, 2018 at 1:30pm

Tensor Methods in Visual Computing
Renato Pajarola
University of Zürich

Abstract

Tensor decomposition methods and multilinear algebra are emerging tools to cope with current trends in computer graphics, image processing and data visualization, in particular with respect to compact representation and processing of increasingly large-scale, high-dimensional and high-parametric data sets and models. Flexible and scalable mathematical models that can process, manipulate as well as compress, store and retrieve such data efficiently are therefore of increasing importance, especially for higher-dimensional data. Initially proposed as an extension of the concept of matrix rank for 3 and more dimensions, *tensor decomposition methods* have found applications in a remarkably wide range of disciplines. However, partly due to the notable initial learning costs, this mathematical framework has not reached yet all its potential awareness in the visual computing research community. In this talk I will introduce the most successful tensor decomposition models and review their application in graphics and visualization, as well as give insights into the benefits they offer and showcase specific applications such as visual data compression, signal processing, interactive manipulation, texture synthesis, and data-driven rendering.

Speaker Bio-Sketch: Renato Pajarola is a full Professor in the Department of Informatics at the University of Zürich (UZH). He received a Dipl. Inf-Ing ETH as well as a Dr. sc. techn. degree in computer science from the Swiss Federal Institute of Technology (ETH) Zurich in 1994 and 1998 respectively. Subsequently he was a post-doctoral researcher and lecturer in the Graphics, Visualization & Usability Center at Georgia Tech. In 1999 he joined the University of California Irvine as an Assistant Professor where he established the Computer Graphics Lab. Since 2005 he has been leading the Visualization and MultiMedia Lab at UZH. He is a Senior Member of ACM and IEEE as well as a Fellow of the Eurographics Association. Dr. Pajarola's research interests include real-time 3D graphics, geometric modeling, point based graphics, interactive large-scale data visualization, remote and parallel rendering, compression and interactive 3D multimedia. He has published a wide range of internationally peer-reviewed research articles in top journals and conferences. Prof. Pajarola regularly serves on program committees, such as for example the IEEE Visualization Conference, Eurographics, EuroVis Conference, IEEE Pacific Visualization or ACM SIGGRAPH Symposium on Interactive 3D Graphics and Games. He organized and co-chaired the Eurographics Conference in 2015, chaired the 2010 EG Symposium on Parallel Graphics and Visualization and was papers co-chair in 2011, and also of the 2007 and 2008 IEEE/EG Symposium on Point-Based Computer Graphics. His co-authored papers received a Eurographics Best Paper Award in 2005, an IADIS Best Paper Award in 2007, a SPIE Best Paper Award in 2013, a Best Student Paper at the Pacific Graphics Conference and an Honorable Mention Award at the ACM SIGGRAPH Symposium on Visualization in 2016.