

KEYNOTE TALK
Monday, December 8, 2014
8:30 AM – 9:30 AM / Ballroom 5

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Graphs in Graphics: An Undirected Trip through the Algorithmic Forest

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Abstract

Graph algorithms are fundamental to many fields including operations research, physically based simulation, mechanics, logistics management, and sensor networks. In this talk, we will celebrate a few graph algorithms that have helped us make significant progress in geometry processing for graphics applications. Since the time graphs were used only for representations such as the tree representation of traced rays in ray tracing and scene graph representation of environments in interactive rendering, the uses of graph and graph algorithms in graphics have become more and more sophisticated. Various graph algorithms such as spanning trees, bi-partite graph matching, graph isomorphisms, 1-factor and 2-factor computations, etc., have been used to process the geometry and topology in order to compress this information, linearly order the primitives for rendering and storage, simplify the geometry for rendering, efficiently represent the geometry for in-core cache coherency, compute topological features such as fundamental cycles, and so on. In this talk we will take a trip through these graph algorithms and their impact on geometry and topological processing in graphics.



Speaker Bio-Sketch: Gopi Meenakshisundaram is a Professor of Computer Science in the Department of Computer Science at University of California, Irvine. He received his BE from Thiagarajar College of Engineering, Madurai, MS from Indian Institute of Science, Bangalore, and PhD from University of North Carolina at Chapel Hill. His research interests include geometry and topology in computer graphics, massive geometry data management for interactive rendering, and biomedical sensors, data processing, and visualization. His work on representation of manifolds using single triangle strip, hierarchy-less simplification of triangulated manifolds, use of redundant representation for big data for interactive rendering, and biomedical image processing have received critical acclaim including best paper awards in two Eurographics conferences and in ICVGIP. He is a gold medalist for academic excellence at Thiagarajar College of Engineering, a recipient of the Excellence in Teaching Award at UCI and a Link Foundation Fellow. He served as the program co-chair and papers co-chair of ACM Interactive 3D Graphics conference in 2012 and 2013 respectively, area chair for ICVGIP in 2010 and 2012, program co-chair for International Symposium on Visual Computing 2006, an associate editor of the Journal of Graphical Models, and a guest editor of IEEE Transactions on Visualization and Computer Graphics.