

The 2013 Visualization Career Award

Gregory M. Nielson

The 2013 Visualization Technical Achievement Award goes to Gregory M. Nielson, Arizona State University, in recognition of seminal research in geometry/topology-based modeling algorithms for visualization and for co-founding the Visualization Conference and TVCG. The IEEE Visualization & Graphics Technical Community (VGTC) is pleased to award Gregory M. Nielson the 2013 Visualization Career Award.

BIOGRAPHY

Gregory M. Nielson is a Professor Emeritus at Arizona State University. He received his BS, MS and PhD in mathematics from the University of Utah in 1965, 1968 and 1970 and immediately joined the mathematics faculty at ASU. In the early stages of his career he mainly taught courses and did research in the areas of Numerical Analysis, Computer Aided Geometric Design (CAGD) and Approximation Theory. In the early 1980s the Computer Science department was formed at ASU where Nielson developed courses in computer graphics, visualization and geometric modeling. His early research centered around spline functions and scattered data modeling. His paper on Nu-Splines (Proceedings of CAGD, 1974) introduced the concept of geometric continuity and tension parameters in conjunction with spline functions and interactive design. Later, Nielson (Math. Comp. 1983) introduced one of the very first methods for interpolating scattered multivariate data with his so-called “Minimum Norm Network” method. Even though this paper was published over 30 years ago, it is still currently being cited. In 1984, Nielson co-edited the special volume of the Rocky Mountain Journal of Mathematics “Surfaces” consisting of many pioneering papers in applied multivariate approximation theory and the connection to the interactive design and visualization of physical objects. Also in 1984, the CAGD journal debuted. Nielson has been an Associate Editor of this journal since this inception. Nielson continues to publish in this area with his recent publications “Normalized Implicit Eigenvector Least Squares Operators for Noisy scattered data” (Computing 2009) and “Techniques for Extracting and Modeling Geometric Features from Point Cloud Data Sets”, (Studies in Computational Intelligence, 2012).

Sensing the importance of computer generated images to aid in the understanding and evaluation of scientific data, in 1989, Nielson convinced the editorial staff of IEEE Computer Magazine to devote an entire issue to this topic. This led to the August 1989 issue of Computer which launched “Scientific Visualization” as a topic of research. A companion video compiled and narrated by Nielson (CSP# 1979AV) illustrated the essential component of “interaction” for many of these applications. Throughout the 1990’s and 2000’s, the role, popularity and importance of Visualization grew tremendously. Because of his key role in this topic of research, Greg was often invited to give seminars/lectures/keynotes at various institutions and conferences around the world. This allowed him to learn



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about the various problems and data sets that other scientists and researchers were having to deal with and this aided him considerably in the development of new modeling and visualization techniques.

Working with others, Greg conceived and initiated the IEEE Visualization Conference series in 1990 where he has served on the Steering Committee and various other committees throughout the years. He was a Cofounder and Associate Editor-in-Chief of IEEE Transactions on Visualization and Computer Graphics which began in 1995. He has had an active relationship with the Russian, Graphicon conference since its inception in 1990. Starting in 1991, Nielson et al organized a series of Dagstuhl Seminars on “Scientific Visualization.” A unique feature of this Dagstuhl series is that it has always had a refereed, published proceedings; the latest of which is “Scientific Visualization: The Visual Extraction of Knowledge from Data”, (ISBN 3540260668, 2005). At the second Visualization Conference (1991) Nielson et al published the “Asymptotic Decider” paper which noted and corrected a flaw in the widely used isosurface algorithm “Marching Cubes”. Nielson has continued to do research in this area with, for example, the introduction of “Dual Marching Cubes” (Visualization 2004) and his most recent publication on this topic being: “Dual Marching Tetrahedra” (Advances in Visual Computing, 2008). Greg has been recognized for his service to the profession having received the John Gregory Memorial Award in Geometric Modeling, the IEEE Outstanding Contribution Award and the IEEE Computer Society’s Meritorious Service Award. He has been an IEEE Golden Core Charter Member since 1996.

AWARD INFORMATION

The IEEE VGTC Visualization Technical Achievement Award was established in 2004. It is given every year to recognize an individual for a seminal technical achievement in visualization. VGTC members may nominate individuals for the Visualization Technical Achievement Award by contacting the awards chair, Lawrence Rosenblum, at vgtc-awards@vgtc.org.