The 2013 Visualization Technical Achievement Award

Kwan-Liu Ma

The 2013 Visualization Technical Achievement Award goes to Kwan-Liu Ma, University of California at Davis, in recognition of his seminal work in large-scale data visualization and new visualization techniques. His work has stimulated research in new fields of visualization. The IEEE Visualization & Graphics Technical Community (VGTC) is pleased to award Kwan-Liu Ma the 2013 Visualization Technical Achievement Award.

Kwan-Liu Ma
University of California at Davis
Award Recipient 2013

BIOGRAPHY

Kwan-Liu Ma is a professor of computer at the University of California-Davis, where he leads the Visualization & Interface Design Innovation (VIDI) research group, and directs the UC Davis Center for Visualization. Kwan-Liu received a PhD degree in Computer Science from the University of Utah in 1993. Before joining the faculty of UC Davis in 1999, he was a staff scientist wit the Institute for Computer Applications in Science and Engineering (ICASE) at the NASA Langley Research Center.

Kwan-Liu first published at the Visualization Conference in 1992. He is one of the very few making important contributions to all three major areas of visualization (i.e. SciVis, InfoVis, and visual analytics). His work often led to new research avenues, helping advance the state-of-the-art in the area. Image graphs and visualizing visualization ('99 and '00) suggested essential topics on visualization interfaces and provenance. In volume visualization, he and his students conducted novel research including intelligent classification ('03), lighting transfer functions ('04), size transfer functions ('08), occlusion spectrum ('09), visualization by proxy ('10), fuzzy volume rendering ('12), and lighting design ('13), which greatly enhance the usability of volume visualization and move the field forward. His team has also introduced new approaches to visualizing complex behaviors, connections, and evolution. These include a fast graph-layout method ('08), organic visualization ('09), storyline visualization ('12), and centrality sensitivity ('12).

One particular area of Kwan-Liu's research that has made profound impact is Large-Scale Data Visualization (LDV). Notable parallel rendering works such as Binary-Swap ('93), SLIC ('03), and 2-3 Swap ('08) all demonstrated unprecedented scalable performance. To address data challenges presented by extreme-scale scientific computing, Kwan-Liu led the effort of realizing in situ visualization and showed it as a feasible solution. His team is the first to demonstrate convincingly in situ visualization of large-scale simulation on massively parallel supercomputers, and the work won the SC06 HPC Analytics Challenge award. His latest in situ visualization work introduces new approaches such as importance-driven data visualization and reduction and explorable images. Kwan-Liu has participated and played important roles in several national LDV research programs. During 2006-2011, Kwan-Liu was the lead of the SciDAC Institute for Ultrascale Visualization, a major investment of the U.S. Department of Energy (DOE) on scientific visualization research. Their achievements made in situ visualization a high priority technology in the following research agenda set by DOE. Kwan-Liu played the driving force behind several of the major professional activities in LDV, including the LDV panel and course at SIGGRAPH ('99), the Ultrascale Visualization Workshop (since 2006), the IEEE LDAV ('10), and the IEEE BigDataVis ('13). He was a guest editor of both the 2001 and 2013 issues of IEEE CG&A on LDV. Kwan-Liu co-authored over 250 scientific publications, and has given a large number of invited talks. He has been honored with various awards for his research accomplishments, including the Presidential Early Career Award in Science and Engineering (PECASE) award in 2000. In 2012, he was elected as an IEEE Fellow for his outstanding research contributions and services.

Since the beginning of his professional career, Kwan-Liu has actively served the research community. Besides serving on numerous technical program committees and reviewing for most of the conferences and journals in the field and funding agencies, he served many times on the IEEE Visualization Conference Committee including as a papers chair in 2008 and 2009. He also served on the Executive Committee of the IEEE VGTC over 2000-03. To promote visualization research in the Asia-Pacific area, Kwan-Liu played the leading role to found the IEEE PacificVis Symposium in 2008. Kwan-Liu has been an associate editor of the IEEE TVCG (2007-11), IEEE CG&A (2006-13), Journal of Computational Science and Discovery (since 2010), and Journal of Visualization (since 2011). He is presently a member of the steering committee of EGPGV, LDAV, and PacificVis.

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-vis-awards@vgtc.org.

For more information, please visit http://www.cs.ucdavis.edu/~ma/.