KEYNOTE TALK

TBD

Machine Learning for Scientific Data Analysis and Visualization Han-Wei Shan The Ohio State University USA

Abstract: In this talk, I will discuss our recent developments on using machine learning for scientific data analysis and visualization, with special focuses on visualization surrogates and compact representations for scientific data. I will first discuss how to construct visualization surrogates that can help streamline the visualization and analysis of large-scale ensemble simulations and facilitate the exploration of their immense input parameter space. Three different approaches for constructing such visualization surrogates: image space, object space, and hybrid image-object space approaches will be discussed. Then I will discuss how neural networks can be used to extract succinct representations from scientific data for rapid exploration and tracking of features. The use of geometric convolution to represent 3D particle data, and how regions of interest can be used as important measures for more efficient latent generation will be discussed.



Speaker Bio-Sketch: Han-Wei Shen is a Full Professor at The Ohio State University, and currently serves as the Editor-in-Chief of IEEE Transactions on Visualization and Computer Graphics. He is a member of IEEE VGTC Visualization Academy, and was the chair of the steering committee for IEEE SciVis conference from 2018-2020. His primary research interests are visualization, artificial intelligence, high performance computing, and computer graphics. Professor Shen is a winner of National Science Foundation's CAREER award and US Department of Energy's Early Career Principal Investigator Award. He received his BS degree from Department of Computer Science and Information Engineering at National Taiwan University in 1988, the MS degree in computer science from the State University of New York at Stony Brook in 1992, and the PhD degree in computer science from the University of Utah in 1998. From 1996 to 1999, he was a research scientist at NASA Ames Research Center in Mountain View California.