

Dynamic Collaborative Visualization Ecosystem (DynaCoVE)

Speaker: Dr. Simon Su
Affiliation: U.S. Army Research Laboratory
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Hall

Abstract:

Dynamic Collaborative Visualization Ecosystem (DynaCoVE) is a Data and Decision Analytics (DDA) tool supporting a data-centric, user-centric, visualization algorithm and systems agnostic visual analytics. It is a visualization software that will allow the user to generate visualization from the data and display it on any of the display systems available in the visualization ecosystem for knowledge discovery and exploration. The display system selected will also support interactive interaction of the visualization created. DynaCoVE supports visualization systems capable of 2D, 2 1/2D, and 3D display supporting fully-immersive, semi-immersive, and non-immersive visualization. Auditory output, together with touch, 2D, and 3D interaction for the appropriate display system will also enhance the visual analytics process. The Army needs to analyze and correlate heterogeneous data from multiple sources has created a visual analytics challenges that cannot be addressed by a single type of visualization system. A hybrid visualization system capable of combining the benefits of both immersive and non-immersive visualization to create a seamless 2D and 3D environment that supports information-rich analysis would overcome some of the challenges.

DynaCoVE is a visual analytics tool that can be used to develop situational understanding by managing complex visualization ecosystem that will develop and sustain a high degree of situational understanding while operating in complex environments against determined, adaptive enemy organizations. In a typical use case, the user will upload simulation data or sensor data and create a visualization using one of the available visualization techniques. Once created, the user will have the option to push the visualization to one of the display systems that is appropriate for the type of visualization created. DynaCoVE will be the realization of an interactive ecosystem of devices, humans, and software that will provide a framework for which a renewed study of the meaning of interaction and computation can be achieved and redefine visual analytics. The applicability of such a system will provides new understanding to data science. Challenges in this topic include complex melding of various visualization systems, visualization techniques, and interaction techniques needed to create a seamless and dynamic visualization environment from multiple spatially aware displays that can evolve over time. Creating interaction mechanisms by using crowd-aware, and context-aware

technologies to facilitate communication within the community of devices, and individuals that form the visualization ecosystem can also be equally challenging.

Brief Bio:

Simon Su (Ph.D., Houston, 2001) is Computer Scientist in the Computational and Information Sciences Directorate (CISD) at the U.S. Army Research Laboratory and a member of the Data Analysis and Assessment Center of the DoD High Performance Computing Modernization Program. His research efforts have focused on Reconfigurable Visual Computing Architecture to enable immersive and non-immersive visual analytics of heterogeneous data. He is responsible for research and development of data visualization and 3D interaction using advanced immersive and interactive technologies. Much of Dr. Su's work supports the analysis and assessment of data generated by users of Department of Defense Supercomputing Resource Center requiring him to collaborate closely with academic and government research partners. More recently, Dr. Su's work has evolved to focus on Big Data Immersive Analytics to support visualization and collaborative interaction of heterogeneous data of the Army Testing and Evaluation Community. Additionally, Dr. Su is involved in research of using the Immersive Analytics to support other areas of data visualization within the Army. Dr. Su earned his Ph.D. in Computer Science from University of Houston (2001). Dr. Su worked as Research Associate at the Texas Advanced Computing Center, The University of Texas at Austin and joined U.S. Army Research Laboratory in 2015.