

Visualizing the Future

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Abstract. Computers are now extensively used throughout science, engineering, and medicine. Advances in computational geometric modeling, imaging, and simulation allow researchers to build and test models of increasingly complex phenomena and thus to generate unprecedented amounts of data. These advances have created the need to make corresponding progress in our ability to understand large amounts of data and information arising from multiple sources. In fact, to effectively understand and make use of the vast amounts of information being produced is one of the greatest scientific challenges of the 21st Century.

Visual computing, which relies on and takes advantage of, the interplay among techniques of visualization, computer graphics, virtual reality, and imaging and vision, is fundamental to understanding models of complex phenomena, which are often multi-disciplinary in nature. In this talk, I will first provide several examples of ongoing visual computing research at the Scientific Computing and Imaging (SCI) Institute as applied to problems in computational science, engineering, and medicine, then discuss future research opportunities and challenges.