

Applied Visual User Interface Technique in Knowledge Management

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Abstract

Extracting actionable insight from large high dimensional data sets, and its use for more effective decision-making, has become a pervasive problem across many application fields in both research and industry. The objective of our presentation is to report on some investigations of this problem covering both these areas. Taking as the problem domain the area of "unsupervised learning" we show that by tightly coupling statistical analysis technique with combinations of visualization components and techniques for interactivity, real-time analysis of multidimensional data can be efficiently made. We give particular attention to the ways in which dynamic visual representations can be used in these contexts to facilitate shared understanding. Our system is implemented and validated in the context of 3D medical imaging knowledge construction, knowledge management and geovisualisation.

Dr Rob Treloar is a project leader within the exploratory science group at Unilever's Port Sunlight Laboratory. He is responsible for a research group focused on the application and development of graphics applications and leads an internal research project, which aims to identify and internalise valuable new directions and applications for visualisation within the business. In this context the group has grown over the last few years to encompass virtual environment and information visualisation activities in addition to traditional scientific visualisation problems and funds a number of external activities in visualisation and image processing. On behalf of Unilever he has participated in several EU projects in the visualisation area including ObjectVR, VIVRE, CONTENTS and SmartDoc, presented externally in the subject area and has contributed visualisation applications to several publications.

Professor Mikael Jern

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Mikael Jern is professor at Linköping University, Sweden. Jern, who also is a founder of UNIRAS, developed the UNIRAS fundamental raster technology. During 1970-1976, Jern worked with Professor Hertz at the University of Lund. Together they invented the Color Graphics System based on the first ink jet plotter for raster based visualization software in the world. In 1976, Jern and Prof Hertz sold the right to manufacture and distribute the Color Graphics Plotting Systems to the U.S.-based CAD company Applicon. In 1980 Jern founded UNIRAS to address the industry with a more general-purpose graphics approach. During 1990-93 he served as the leader of the UNIRAS research team in the USA, concentrating on VUI technology customized visualization widgets and advanced real-time interactive 3D technology. Since 1997, Prof Jern is managing several large EC projects (INDEX, NOVICE, CONTENTS and SmartDoc) in the domain of visualization. These projects have developed innovative Web-based visualization technology based on both VRML and downloadable Web components. He has also consulted with the EC Commission as a technical expert in visualization. His recent areas of research interest include Information Visualization, Medical Visualization and 3D collaborative visualization on the Web and particular the use of visualization component technology in visual data mining. He has published more than 150 technical papers and several books in visual computing and visualization application areas. At SIGGRAPH 93, he was elected "pioneer of computer graphics".