

EMERGENT VISUAL INFORMATION SYSTEMS

Anthony R. Mackay, University of Guelph
Stuart Nisbet, SAS Institute Inc.

This videotape presentation catalogues the on-going research and development effort of SAS Institute in the stimulating new realm of visualisation technology. It also provides an insight into the broad scope of application of the underlying software and its myriad uses by the University, described in some detail at previous SUGI conferences.

The computing world is on the threshold of a quantum leap forward in visual information systems and the opening segment of today's program begins in grand style with a kaleidoscope of visual images reflecting the prestigious New York locale of SUGI 18.

The viewer is then given an in-depth briefing on the new PROC DATASCOPE software being developed at the Institute. In particular, its ability to represent five dimensional applications is of highly practical value. For example, ground terrain and altitude may be denoted by Cartesian co-ordinates in three space, density of pollutants in the atmosphere as a fourth and the whole model expressed on a fifth, temporal basis. Cutting planes, normal to the vertical axis, allow the researcher to view pollutant data at various altitudes and animate these over time. Skewed, non-orthogonal, cutting planes show concentration levels over a region of the ground at different altitudes. Multiple planar intersections permit visual inspection of areas of interest. Subsets of pollutant concentrations may also be viewed and animated using the feature known as Point Clouds and specific single levels of concentration may be "shrink wrapped" over the ground model and observed under the influence of wind over time. These are known as Iso-Surfaces. Thus, rapid, close visual inspection of the data is possible and the observer is able to isolate trends which are of particular interest for further rigorous statistical treatment. SAS datasets may be read directly. The software also operates in conjunction with

SAS/NVISION™ and this makes production quality video animation, air brushing and compositing available to the user. Possible areas of application of this technology include pharmaceutical industry use (e.g. drug absorption within the body), financial/stock market use (e.g. high/low, buy/sell data), oil industry use (e.g. well and ocean pollutants) and use by environmental study groups.

A short visual tutorial then follows on aspects of SAS/NVISION™. Splines, shading, specularity, ray tracing, lighting and other features used to make objects photo-realistic are demonstrated. An example of the quick render feature, useful for verifying animation sequences, is also shown.

Digital image processing and playback are powerful new applications being developed by the Institute and today's presentation contains a short sequence demonstrating air brushing, painting, assembling multi-level composites without degradation in quality and also an example of the new morphing feature which allows a visual image to bend and flex into the shape of another. Although the example shown is of a human head changing shape, this technology has wide application in the scientific study of distortion over time (e.g. erosion of mountains or soil from one millennium to another).

The University has a long standing involvement in the study and use of Geographic Information Systems and the new SAS/GIS™ product under development is of particular interest to researchers. Today's videotape contains an overview of its features and likely areas of application.

The program concludes with an example of the artistic uses of the SAS/NVISION™ software which exemplifies its very high quality photo-realistic properties.

Readers having an interest in this type of work who would like to have additional information about these

developments are invited to contact either:

Mr. Anthony R. Mackay,
Room 130 Johnston Hall,
University of Guelph,
Gordon Street, Guelph,
Ontario, Canada N1G 2W1

Tel: 519 824 4120 x3450
Fax: 519 766 1423
Email: MACKAY@OAC.UOGUELPH.CA

or:

Mr. Stuart Nisbet,
Computer Graphics Division,
SAS Institute Inc.,
SAS Campus Drive,
Cary, NC, USA 27513

Tel: 919 677 8000
Fax: 919 677 8123
Email: SASSAN@UNX.SAS.COM

SAS, SAS/NVISION and SAS/GIS are registered trademarks or trademarks of SAS Institute Inc. in the USA and other countries. ® indicates USA registration.