MAN T&EC

The Manchester and North HPC
Training and Education Centre

The Application Visualisation System (AVS)

An introductory course

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1 Overview

AVS is a system which allows users to visualise their data by constructing applications from a series of software components called modules. This course introduces the attendee to all the various aspects of the system and will equip them with the skills to import and apply various visualisation techniques to different classes of data. It is of one days duration, consisting of a number of theoretical and practical sessions to support each topic.

The course has been developed by the Manchester and North High Performance Computing Training and Education Centre (MAN T&EC) and is based on an earlier version produced by Computer Graphics Unit, Manchester Computing Centre (MCC) for the UK Advisory Group on Computer Graphics (AGOCG).

The course will not include more advanced topics such as module writing but these are covered in the companion course in this series, *Advanced AVS*. The introductory course will however provide the attendee with the necessary AVS pre-requisites to attend the Advanced AVS Course.

2 Target Audience

Those interested in learning how to use AVS to visualise 2D and 3D data

3 Skills required

This course is designed for the user with no prior experience of AVS. No programming is required but some basic experience of working in a workstation environment (unix and X windows) is needed.

4 Skills gained

- Experience of using AVS and its associated sub-systems
- Constructing applications using the network editor
- Importing data into AVS
- Manipulating geometric scenes
- 2D and 3D visualisation case studies
- An introduction to unstructured cell data (UCD)

- Miscellaneous features of AVS

5 Materials provided

- Course introduction, syllabus and overview
- Overhead masters
- Overhead overview for students
- Student workbook for the introductory course
- Data files for the introductory course
- Student workbook for the AVS Data Interchange Application (ADIA)
- Data files for the ADIA workbook

6 Course Syllabus

6.1 Overview of AVS (15 minutes)

- Some examples of AVS (35mm slides)

6.2 The Network Editor (75 minutes)

- Building an application in the network editor
- Modules and networks
- Network editor exercise (Chapter 2 of the Student Workbook)

6.3 The Geometry Viewer (30 minutes)

- What can the geometry viewer do?
- Manipulating objects
- Software and hardware renderers
- Manipulating light sources
- Composite objects
- Geometry viewer tutorial (Chapter 2 of AVS Tutorial)

6.4 Importing Data into AVS (45 minutes)

- Overall scheme
- Describing data
    - Dimensions
    - Mapping methods (uniform, rectilinear and irregular)
    - Data elements
    - Operators to read the data file
    - Format of the header file and keywords
- Some examples

6.5 2D visualisation case studies (15 minutes)

- Networks to visualise MRI data (colorizer module)
- Networks to visualise temperature data (field_to_mesh module)
- Exercises of visualising 2D arrays (Chapter 3 of the Student Workbook)

6.6 3D visualisation case studies (15 minutes)

- Visualising scalar components
- Visualising vector components (hedgehog module)
- Exercises of visualising 3D arrays (Chapter 4 of the Student Workbook)

6.7 Miscellaneous features (30 minutes)

- AVS command line options
- AVS Command Line Interpreter (CLI)
- Obtaining hardcopy from AVS
- Customising AVS (.avsrc)
- Exercise to illustrate AVS demo suite (Chapter 6 of the Student Workbook)
- Exercises of AVS hardcopy and customising (Chapter 7 & 8 of the Student Workbook, optional)

6.8 Overview of UCD Data (30 minutes)

- What is unstructured cell data?
- Importing and visualising UCD data
- Exercises of visualising UCD data (Chapter 5 of the Student Workbook)

6.9 Closing comments (5 minutes)