*Date: 5-23-98*
*Due Date: 6-9-98*

# CS 523: Scientific Visualization

## Assignment 4

The first part of this assignment is designed to help you get you more acquainted with the scientific visualization software package SGI Iris Explorer, for scalar and vector field visualization. IRIS Exporer runs on the SGI Indigo's in the CES lab.

The second part of the assignment explores flow field topology visualization. For the flow field topology problem, you will hand results as per usual.

All data files for this assignment can be found in the directory in the CS 523 web page in the data directory.

Part I (a) Given the 3D scalar field data set in the file `p1.sml.dat` (a magnetic resonance angiography data set of vessels in a human brain), complete the following using one of the packages described above:

- Convert the data into the appropriate format
- Volume render the data set, using appropriate color and opacity maps that visualize the vessels clearly.
- Create an isosurface, using an isovalue that extracts the vessels well.
- Experiment with other scalar field visualization options

The data is sampled on a regular 3D lattice and consists of $128 \times 128 \times 54$ 8 bit binary values. It is also available in a formatted form in file `p1.sml.formatted.dat`, to make life a little easier for those using Fortran.

(b) Given the data in files data3.pts, data3.tetra, data3.scale, and data3.vec, complete the following one of the scientific visualization packages described above. (see the README file for file format information):

- Convert the data into the appropriate format
- Display the geometry
- Display scalar isosurfaces (choose 3 surfaces which are reasonably spaced from each other)
- Display the integral curves of the vector field
- Experiment with other vector field visualization options

Part II (a) Locate the critical points in the vector field.

(b) At each critical point, display the vector field using an arrow field. Print out a grayscale image of the vector field (you can do this by using a utility called snapshot on the SGI, for example).

Nate will send you email on what to handin for this assignment.