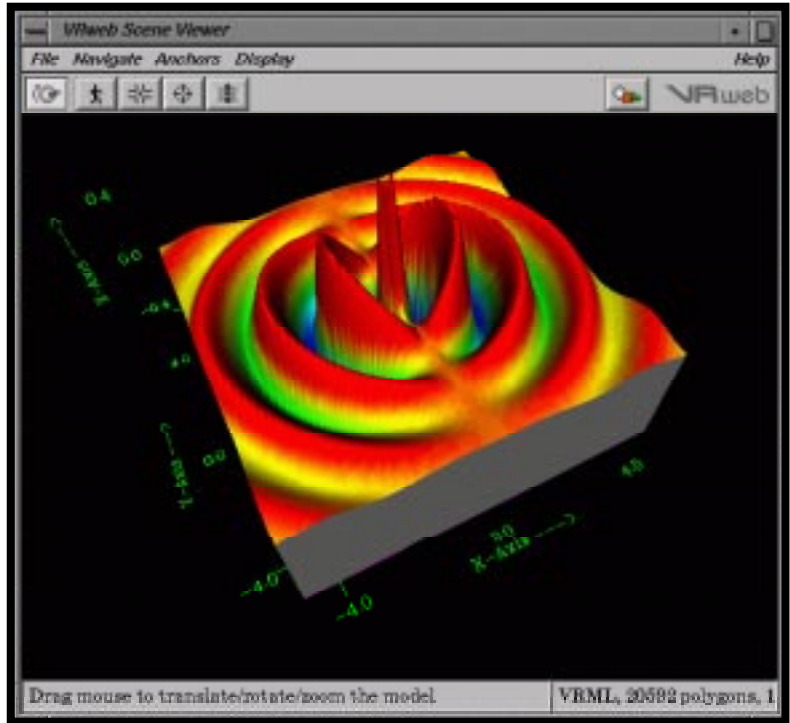


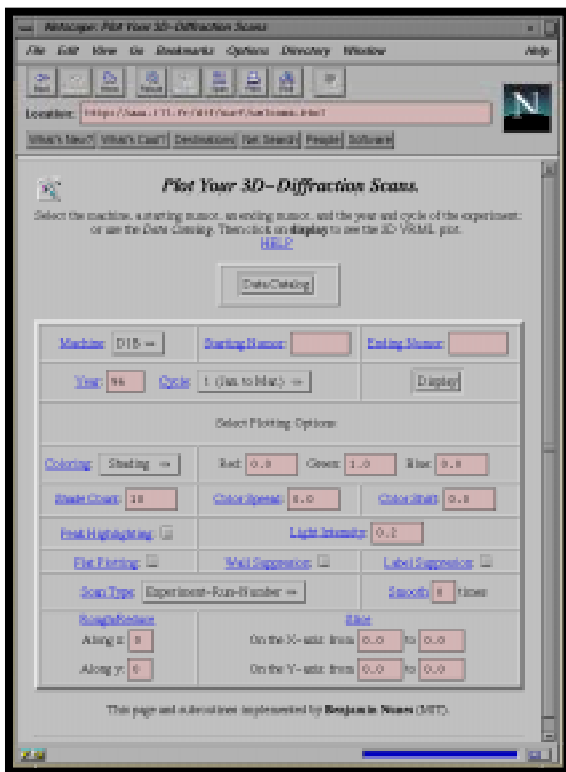
Surf3D: Data Visualization Using VRML

**Programming at the
Institute Laue Langevin,
Grenoble, France.
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Making data visualization as easy and helpful as possible was the main focus of this three month internship. My main project was to develop a program to read 3D diffraction scan data (in which scattered intensity is a function of the beam-angle, 2θ , and some other variable), and to produce a Virtual Reality



Modeling Language (VRML) file describing the data surface. My solution was Surf3D, a program



written in C. It can create a VRML surface from files containing either ILL diffraction machine data, or simple rectangular coordinates. Surf3D uses an array of doubly linked lists as its data structure. This structure is manipulated by three processing functions: a smoothing function to reduce noise, a roughing function to reduce the size of the final VRML file (by reducing the number of data points used), and a slicing function to slice out a portion of the data surface for closer study. Finally, an internal WWW interface was created to allow ILL scientists to use Surf3D to plot their raw, diffraction scan data as soon as it is generated.