

Dancer: Real-time Graphics in a 3D Environment

Leland Wilkinson, Matthew Rubin, Andrew Norton
SPSS Inc. and Illumitek Inc.

The Grammar of Graphics (Wilkinson, 1999) outlines a system for creating charts and graphics within an object-oriented framework. Rope, Rubin, Wilkinson, and Carr implemented this system in a Java foundation class library called nViZn (formerly GPL). Like most existing graphics packages (including some dynamic graphics packages), nViZn is based on a static data model in which the entire display depends on the state of the data at a particular instant. Data changes require a redraw of the whole graphic. With modern graphical hardware, these updates can be effected rapidly enough to enable real-time animation, but with a waste of considerable computer resources.

Dancer is a project to implement graphics grammar with a time-dependent data model. Geometry, statistics, and rendering are computed in real time and, most importantly, a scene model is used to update only aspects of the display that actually change at a given moment. The result is, figuratively, a 3D geometry engine that behaves like a medical heart monitor.