

5th Annual Joint Bioinformatics Workshop

July 19, 2005
2229 Seamans Center
University of Iowa

by

Alicia Guidry
Iowa State University

Visualizing Complex Metabolic Interactions Using Three-Dimensional Graph Models

ABSTRACT

Studying science can be difficult without the use of models. However, those models are only as good as the information they convey. This project models metabolic pathways in an immersive three-dimensional virtual environment called the C6. The metabolic pathways are represented using a three-dimensional graph structure. Complex networks can be difficult to interpret and navigate through, therefore different types of navigational aids such as color and interactions are used to explore the models.

Various colors represent the types of nodes, such as RNAs, protein complexes, and metabolites in the metabolic pathways. Incorrect color selection can make it very difficult for people with red/green or blue/yellow colorblindness to distinguish between the pathways and node types. Colorblindness affects around 5% of men and 0.5 % of women. We are working to create an interface that will allow users to interactively choose colors that accommodate the way their eyes process color so that they can differentiate pathways and nodes from another.

Interactions using speech recognition will also be explored. Using a handheld computer, the user will be able to vocalize a specific pathway, node or organelle name that they can explore within the environment.