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Emilie Hogan* (emilie.hogan@pnnl.gov) and **Cliff Joslyn**. *Visualizing semantic data through the use of partially ordered sets*. Preliminary report.

A major challenge in business, industry, and government is making use of large amounts of collected data. A common type is semantic data, data that is organized as objects and labeled relationships between them. “Ontologies” are used to keep track of the meaning of the labels, and are hierarchical structures, e.g., WordNet. Displaying an ontology to an analyst is an important part of making use of the data. Our approach is to model the ontology as a finite, bounded, partially ordered set (poset), and focus on the vertical layout of the poset. For a graded poset this is not difficult. However, the posets resulting from ontologies tend to be ungraded. We introduce a concept called interval rank where the location of each element in the poset, in relation to the top and bottom, is described by an integer interval. The intervals can then be partially ordered.

We show that interval rank, R , is an order preserving map, and prove that repeated application of the interval rank function yields a privileged total preorder on the data. This pushes us towards a preferred vertical layout. We also show that the height, width, and dimension of the poset change monotonically through repeated application of R . Finally we investigate possible “measures of gradedness” for posets. (Received September 22, 2011)