Semantic Hierarchies: Induction, Measurement, and Management

- **Semantic Hierarchies:**
  - Cores of ontologies
  - 80-90% of links in real-world ontologies
  - Becoming large:
    - $10^4$-$10^6$ nodes

- **Need for algorithms and measures**
  - Induction from text
  - Visualization, annotation
  - Alignment, matching

- **Mathematical order theory**
  - Metrics: Distances and similarities based on semi-modular valuation functions
  - Ranks: Structure of vertical levels
  - Morphisms: Mappings and linkages

- **Issues for knowledge systems**
  - Enable robust use of multiple inheritance: beyond trees!
  - Avoid risks of pure graph theory, path-counting methods
  - Proper use of vertical levels

- **Concept lattices**
  - Semantic hierarchies from relational data
  - Capture implication relations dually between objects, attributes
  - Unbiased, graphical, visual representation