

# Regular Labelings and Geometric Structures

David Eppstein

Computer Science Department, University of California, Irvine

**Abstract.** Three types of geometric structure—grid triangulations, rectangular subdivisions, and orthogonal polyhedra—can each be described combinatorially by a *regular labeling*: an assignment of colors and orientations to the edges of an associated maximal or near-maximal planar graph. We briefly survey the connections and analogies between these three kinds of labelings, and their uses in designing efficient geometric algorithms.