

Measuring the distance of generalized maps

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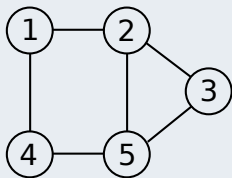
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Motivations

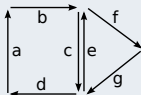
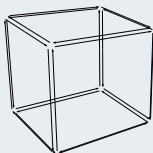
- ≡ Image classification
- ≡ Image modeling (2D/3D/...)
- ≡ Basic tools for map comparison

Planar Graphs



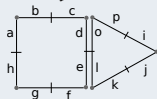
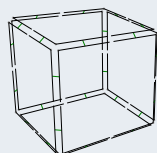
≡ 2 dimensions

Combinatorial maps



≡ N dimensions

Generalized maps



≡ N dimensions

≡ Easier definitions

Definition

- ≡ Size of a map
- ≡ Maximum common submap ($mcs(M, M')$)
- ≡ Same principles as "A graph distance metric based on the maximal common subgraph", Bunke and Shearer, 1998

Main Result : Distance

- ≡ $d(M, M') = \frac{|mcs(M, M')|}{\max(|M|, |M'|)}$
- ≡ d is a metric
- ≡ computing d is a NP-hard problem

Main Result : Algorithm to approximate a distance

- ≡ Matchings of darts
- ≡ Extracting common submap from matching of darts

Heuristic

- ≡ Maximize the topology preserved by matching
- ≡ Seeds depending on the neighborhood

Preliminary results

- ≡ Experimental comparison of two proposed algorithms