Remarks on Notation

We use the symbol Δ for our main Laplace-type operators, with the sign convention of geometers rather than of analysts. This makes our operators positive. Thus, the Euclidean Laplace operator on $\mathbb{R}^n$ is

$$\Delta = -\sum_{i=1}^{n} \frac{\partial^2}{\partial (x^i)^2}.$$

This is a special case of the Hodge Laplacian of Riemannian geometry,

$$\Delta = dd^* + d^* d,$$

operating on differential forms, where d is the exterior derivative and d^* its L^2-adjoint with respect to the product defined by the Riemannian metric.

In discrete geometry, however, there are various variants of the Laplace operator, and we denote those that are not our main ones by other symbols, such as $L, \mathcal{L}, A, \ldots$.

The degree of a vertex i of a (hyper)graph is denoted by $\deg i$; for the maximal (minimal) degree of the vertices in a (hyper)graph, we use the symbol $\overline{d}$ ($\underline{d}$). The cardinality of a hyperedge e is denoted by $|e|$. The cardinality is the number of vertices contained in e. Thus, the cardinality of an edge in a graph is always 2 (except for self-edges [which we usually do not allow], which would have cardinality 1). The maximal cardinality of hyperedges then is either $\overline{c}$ or Θ.

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