An Extensible Framework for Modeling Simplicial Complexes

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Our contribution – The Mangrove TDS Framework

- A tool for the *fast prototyping* and *design* of any *topological data structure* (*TDS*) for simplicial complexes, also non-manifold.
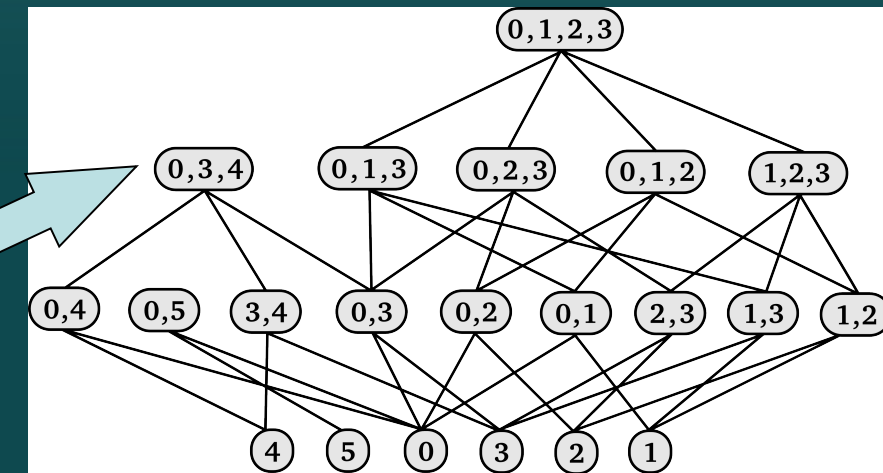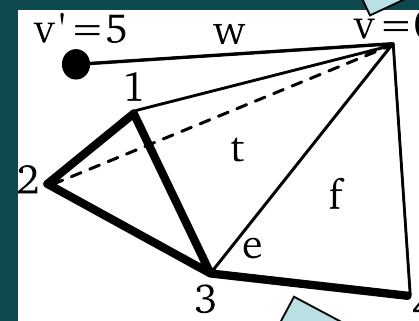
- Based on *mangroves*, namely graph-based representations of *connectivity information*:
  - *Extensible* - easily customized for any modeling need;
  - *Plugin-oriented* – mangroves are loaded at run-time dynamically.

- Implicit representations of *ghost simplices*, not directly encoded in any TDS, that *improve* the *efficiency* of topological queries.

Example*: the *Incidence Simplicial (IS)* data structure (*De Floriani et. al., 2010*)

Boundary relations

Partial Co-boundary relations

Six data structures are *completely* implemented with *topological queries.*