

Using Kernels on Hierarchical Graphs in Automatic Classification of Designs

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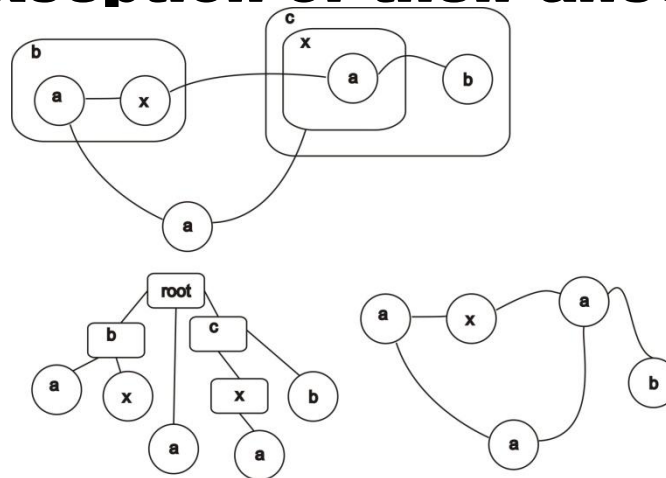
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Motivation

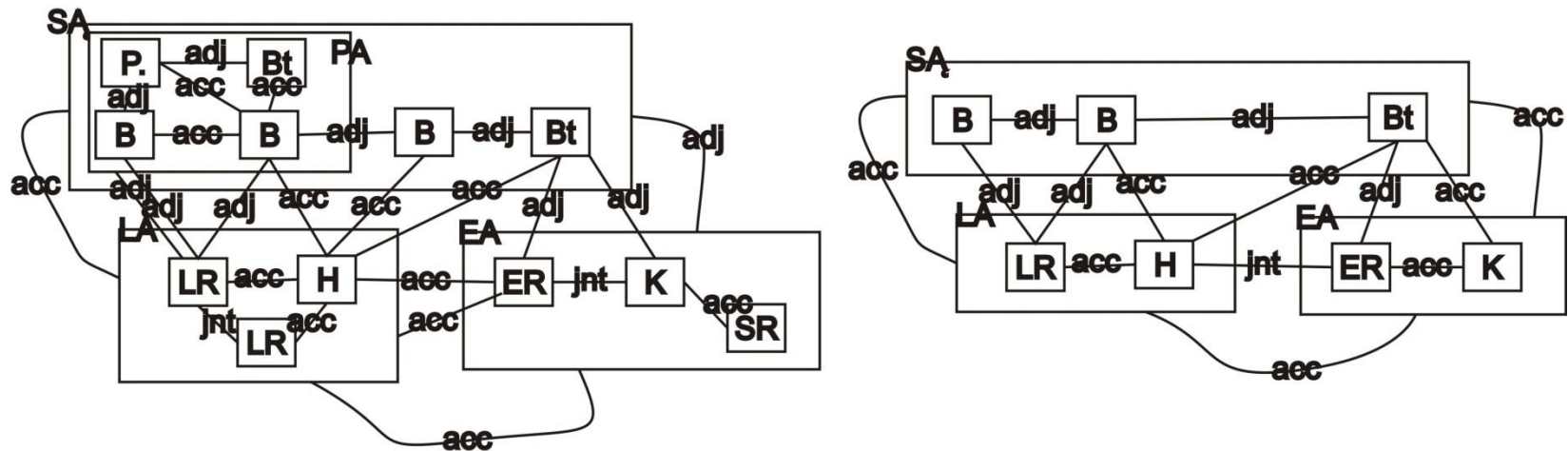
- **Supporting a designer at an early stage of design process**
- **Searching for similarity of new and good graphs**
- **Classification of designs at the level of their structure**
- **Removing structurally incorrect designs at the early stage**
- **Providing an automatic „experience” by comparing new design to earlier ones**

Hierarchical Graphs

- **Hierarchical graphs (HGs) - an extension of traditional graphs:**
 - **consist of nodes and edges,**
 - **nodes in HGs can contain internal nodes, called children**
 - **children can contain other internal nodes**
 - **children can be connected to any other nodes with only the exception of their ancestors.**



Design Task



Examples of hierarchical graphs representing floor layouts (nodes labelled B represent bedrooms, Bt → bathrooms, K → kitchens, ER → eating room, LR → living room, H → hall, St → storage, P → play room, SA → sleeping area, GA → guest area, EA → eating area and LA → living area, edges labelled by adj represent adjacency between spaces, acc → accessibility (wall with doors) and jnt → open access (no walls))