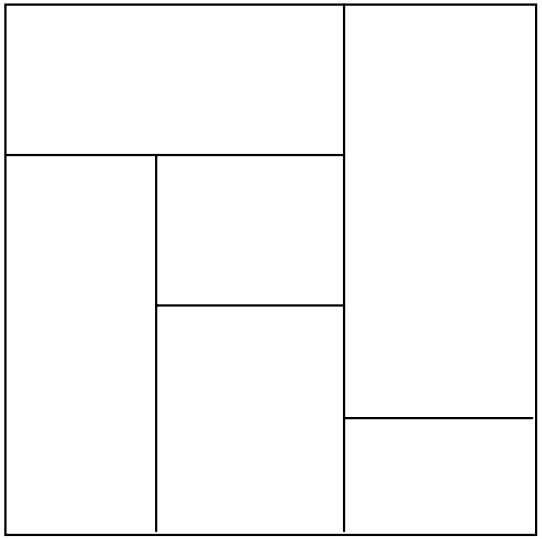
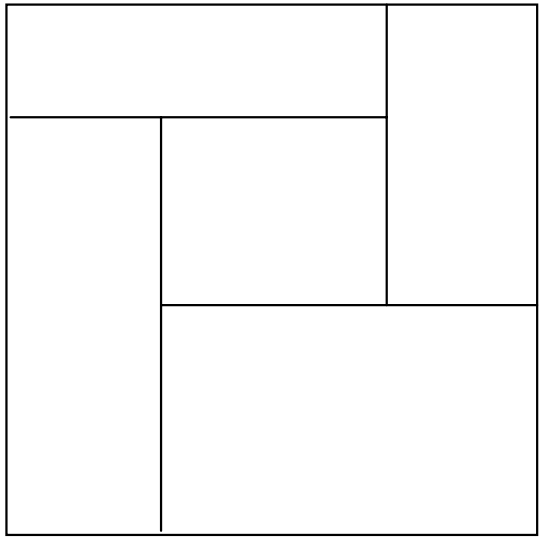
FLOOR-PLANNING

Somchai Prasitjutrakul

Slicing vs Non-Slicing Structures



slicing structure



non-slicing structure

Placement Algorithms

- Constructive placement algorithms
  - Cluster growth
  - Partitioning-Based
  - Global Placement
- Iterative placement algorithms
  - Pairwise interchange
  - Simulated annealing

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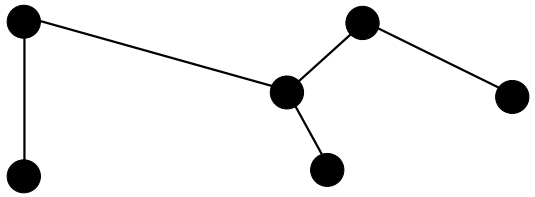
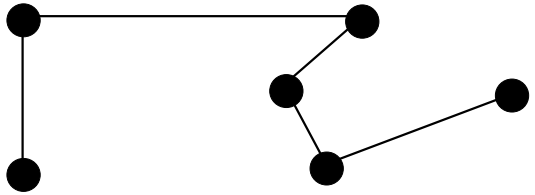
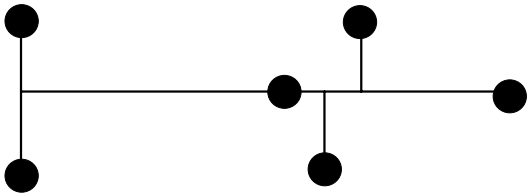
Interconnection Structures



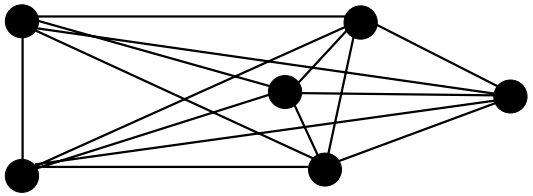
Spanning tree



Chain

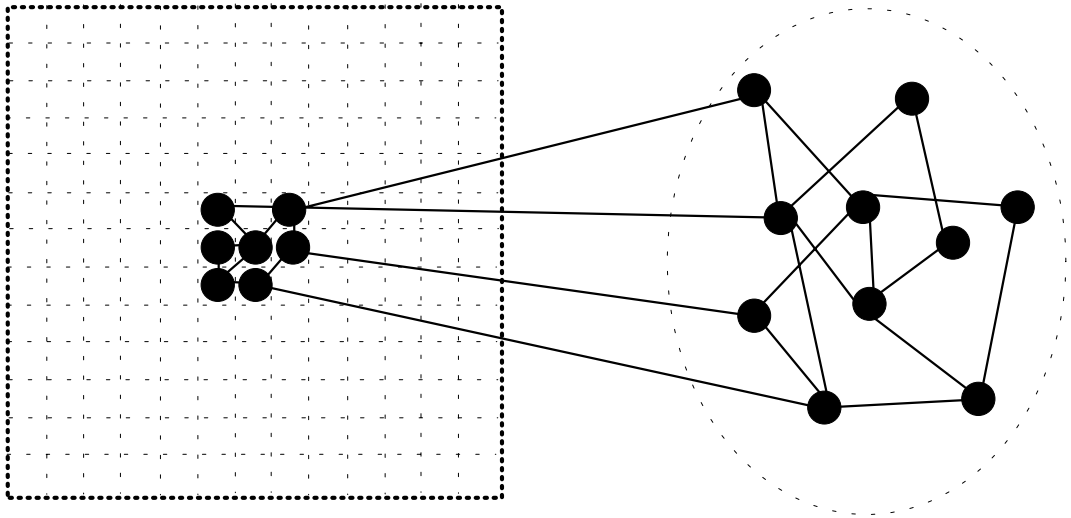


Steiner tree



Complete graph

Cluster Growth Placement



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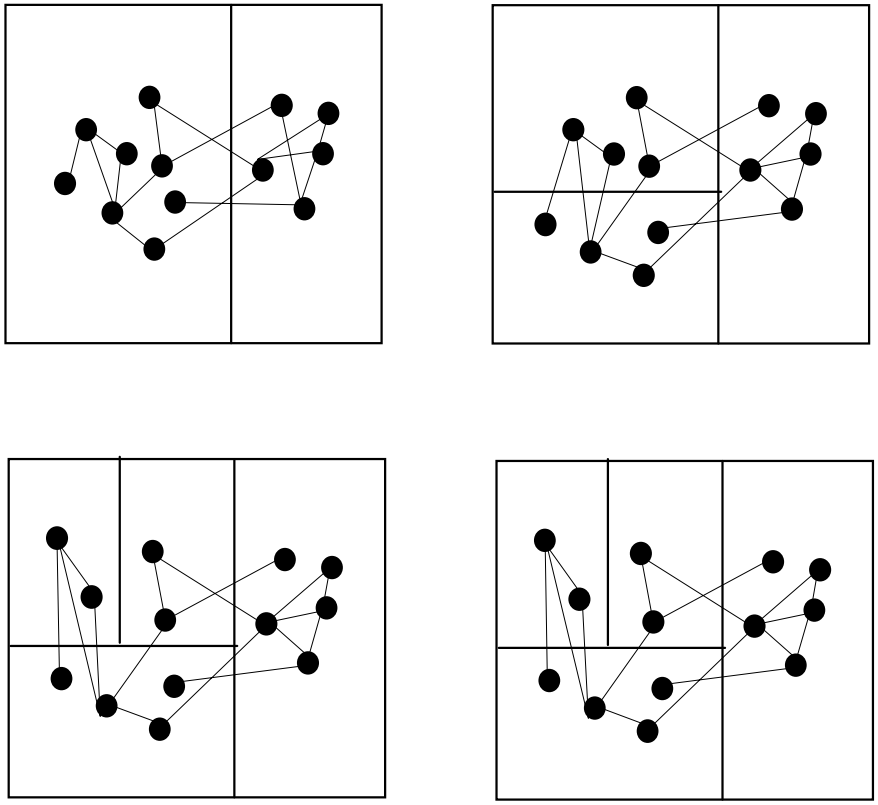
Partitioning-Based Floorplanning



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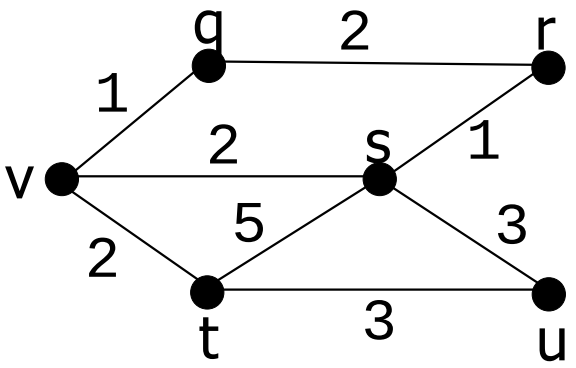
Quadratic Assignment



c_{ij}

¡	¢	¤
§	¨	©
a	®	¬

d_{mn}

q	t	r
	u	s
	v	

$$f = \sum c_{ij} \times d_{p(i)p(j)}$$

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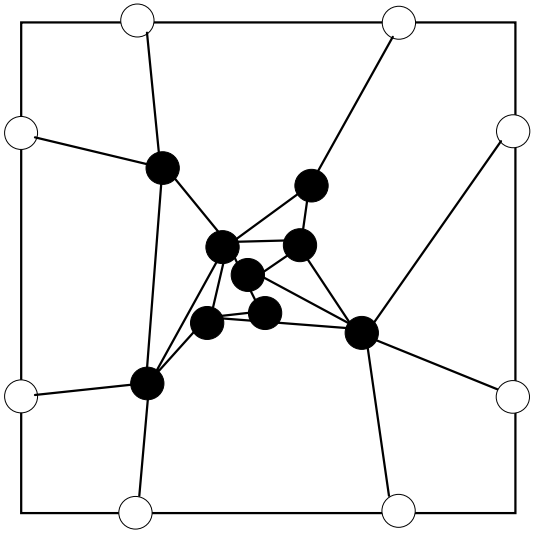
Force-Directed Placement



$$f = \sum c_{ij} \left(\Delta x_{ij}^2 + \Delta y_{ij}^2 \right)$$

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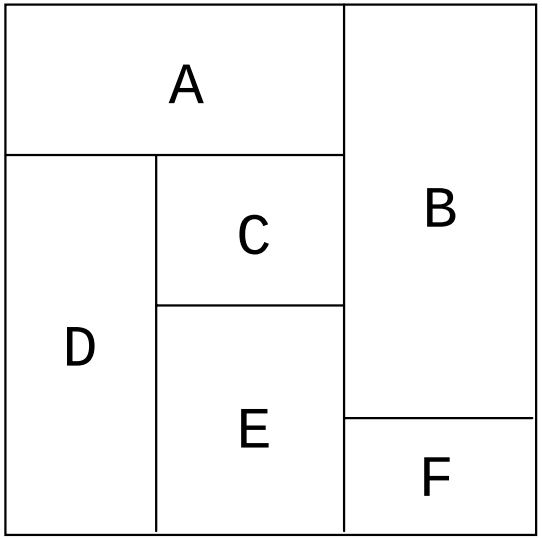
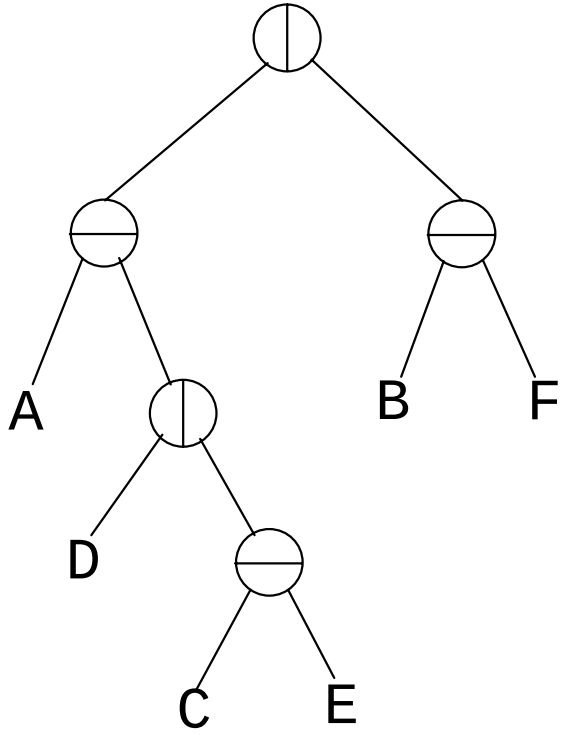
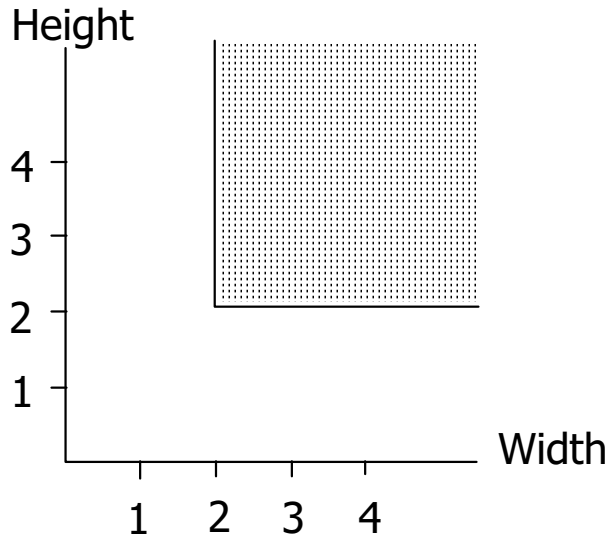
Slicing Trees



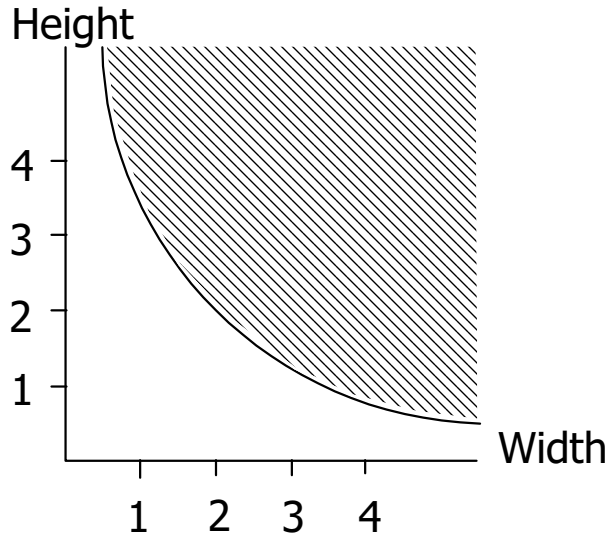


Module Shape Functions

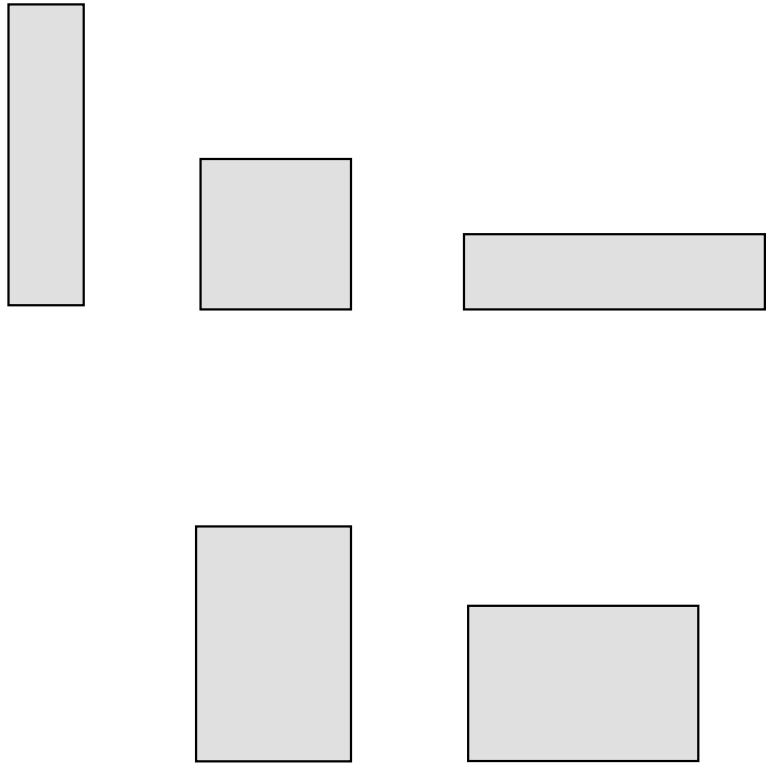
Fixed-shape module

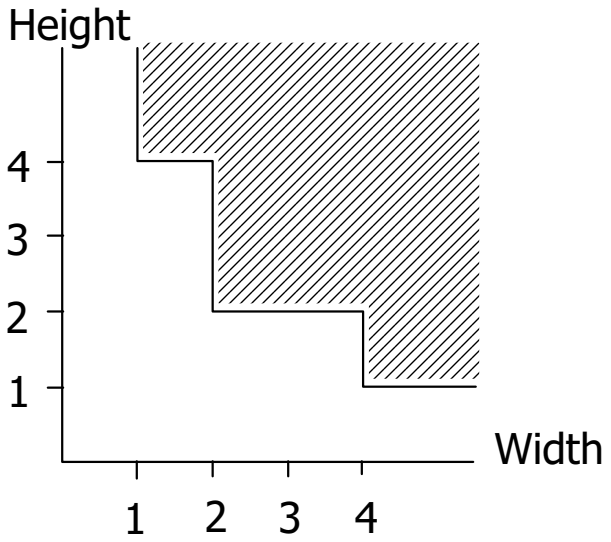


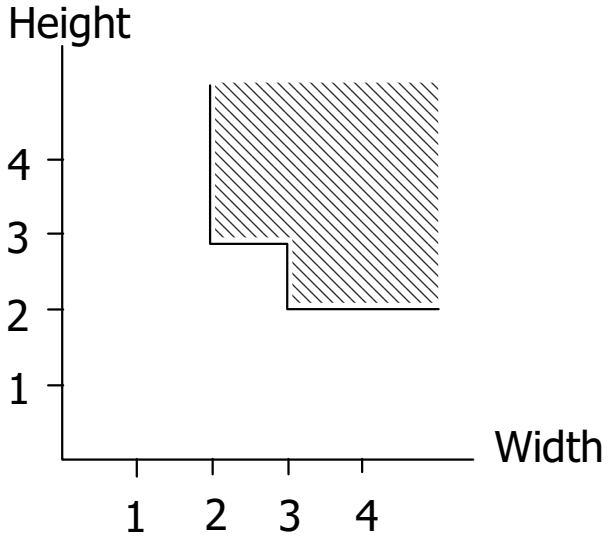
Variable-shape module



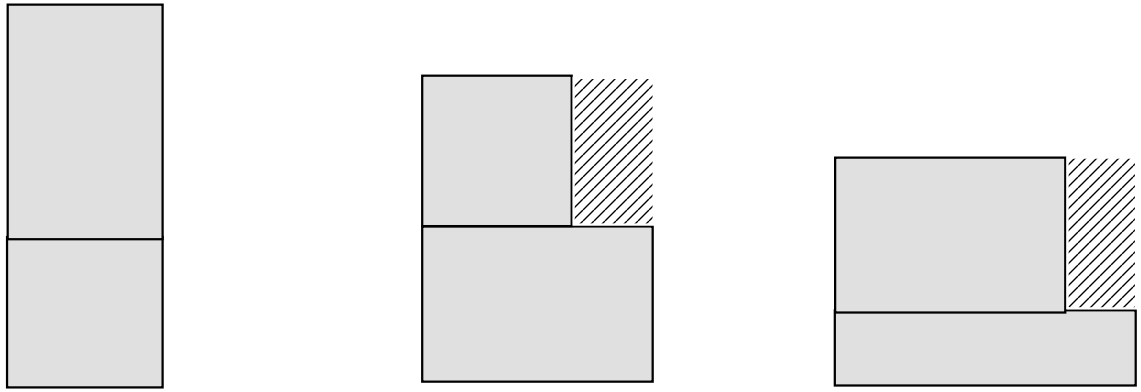
Module Shape Functions

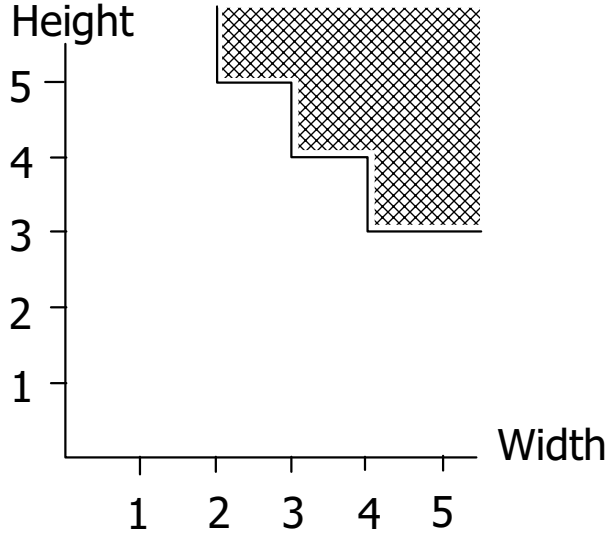






Summation of Shape Fucntions





Determining Dimension of Modules

2-pass traversal

- **bottom-up**
  determine a set of possible floorplan outer dimension
- **top-down**
  determine a specific dimension and location for each module