CS 430 Presentation 1

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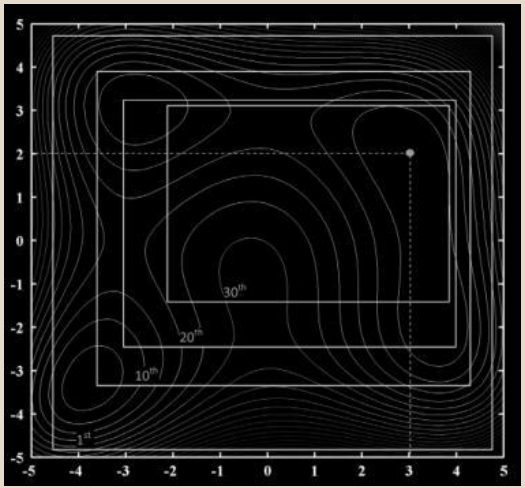
Based on Gandomi (2014)

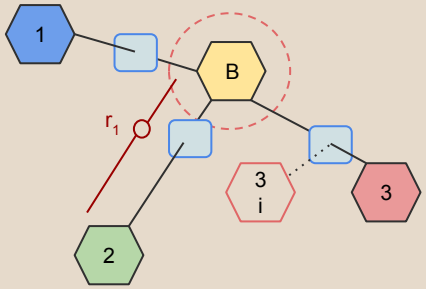
https://www.architectureartdesigns.com

Interior State Algorithm

- ★ Genetic algorithm with local and global search components.
- ★ Small number of parameters
  - ○ Boundary constraints, mirror ratio, local search range, aesthetic fitness function.
- ★ Special mirror items affect the fitness of normal items.



Gandomi, 2014



Mirror Position Selection

ISA Pseudocode:

1. Randomly place items in full space
2. While end conditions not met:
   - 2.1. Divide all items except the global best g_b into mirror and composition (comp) categories.
   - 2.2. Shuffle the location of every composition item within shrinking constraints (x_{min}, x_{max})
   - 2.3. Randomly place a mirror between each mirror item and a random location near the global best item.
   - 2.4. For each item in the mirror and comp group, if the new position is fitter than the last position, keep the item and any associated mirrors.
   - 2.5. Update boundary, mirror ratio, and global best walk range.

Gandomi AH, Interior search algorithm (ISA): A novel approach for global optimization, ISA Transactions (2014)