DM811

Heuristics for Combinatorial Optimization

Lecture 5

Construction Heuristics, TSP

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Outline

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Construction Heuristics

Construction heuristics specific for TSP

- Heuristics that Grow Fragments
  - Nearest neighborhood heuristics
  - Double-Ended Nearest Neighbor heuristic
  - Multiple Fragment heuristic (aka, greedy heuristic)
- Heuristics that Grow Tours
  - Nearest Addition
  - Farthest Addition
  - Random Addition
  - Clarke-Wright savings heuristic
  - Nearest Insertion
  - Farthest Insertion
  - Random Insertion
- Heuristics based on Trees
  - Minimum spanning tree heuristic
  - Christofides' heuristics
  - Fast recursive partitioning heuristic

Construction Heuristics for TSP

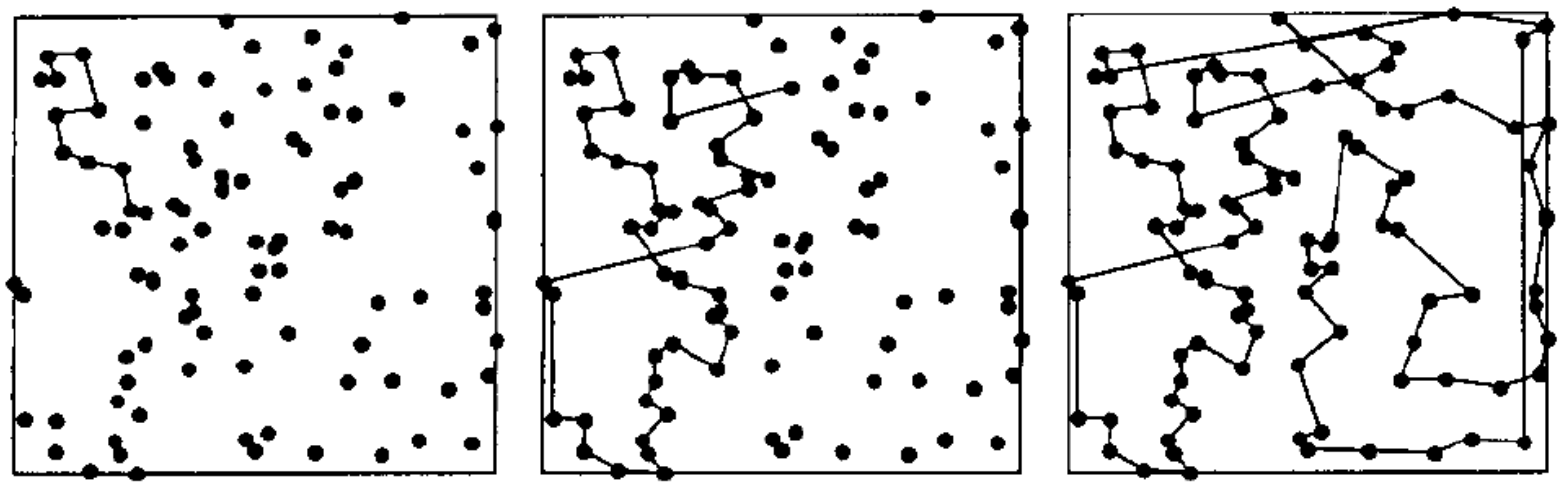

Figure 1. The Nearest Neighbor heuristic.

Construction Heuristics for TSP

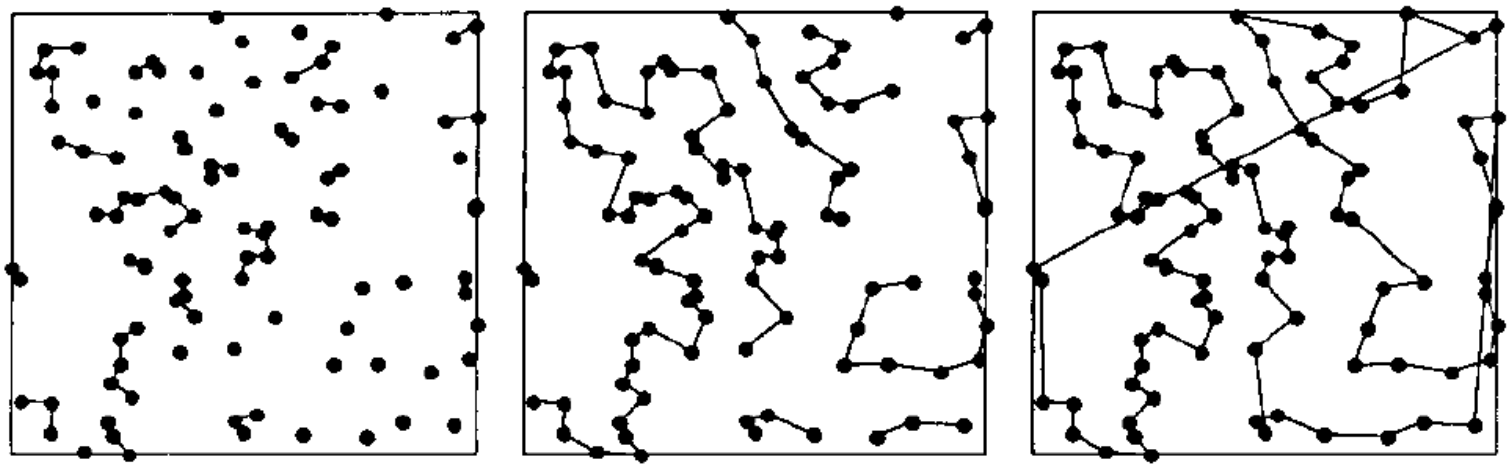

Figure 5. The Multiple Fragment heuristic.

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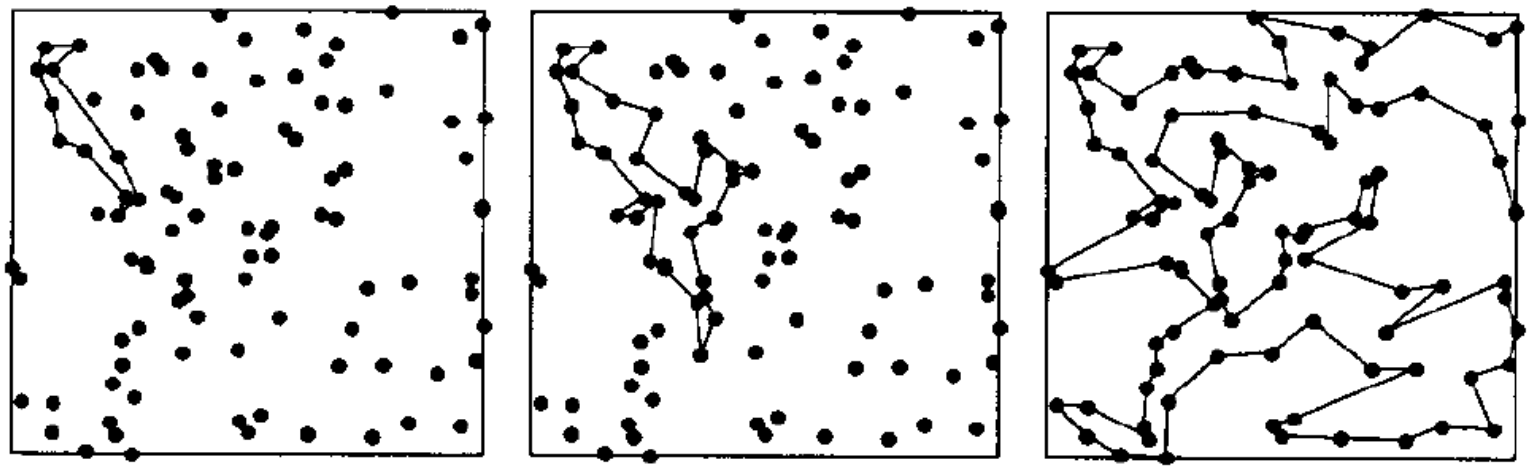

Figure 8. The Nearest Addition heuristic.

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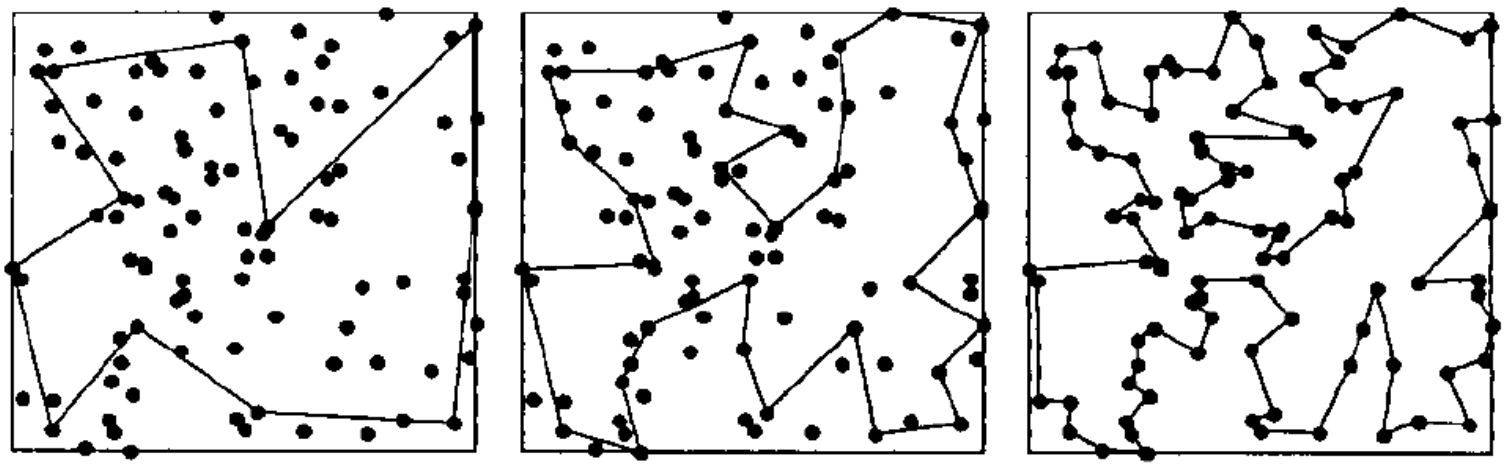

Figure 11. The Farthest Addition heuristic.

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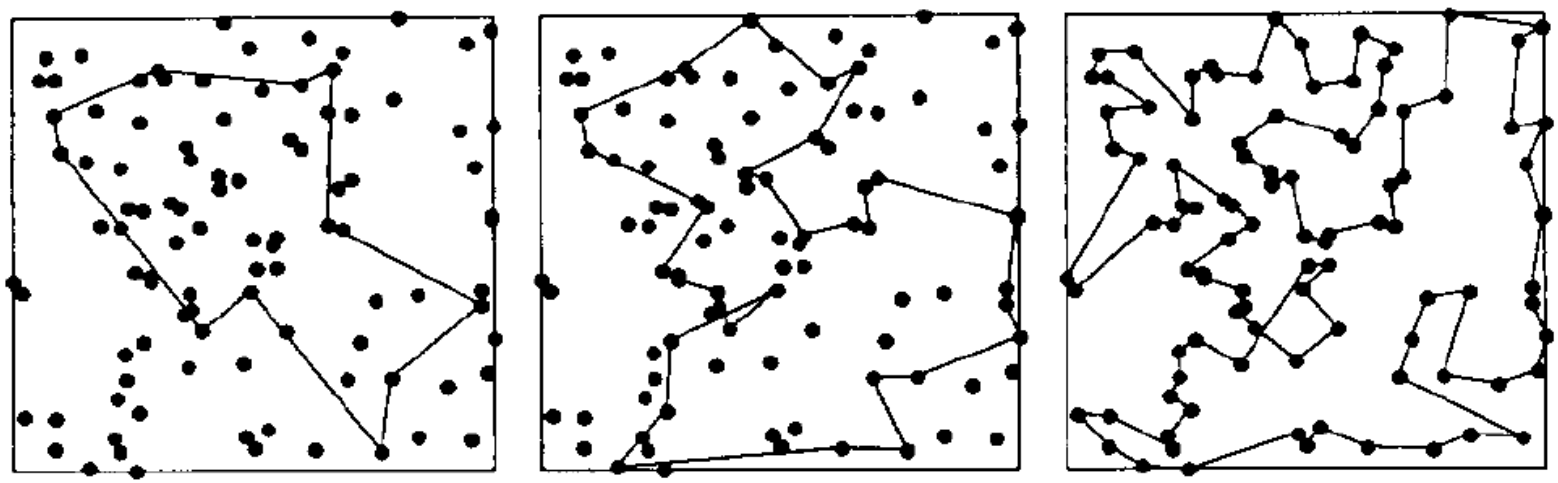

Figure 14. The Random Addition heuristic.

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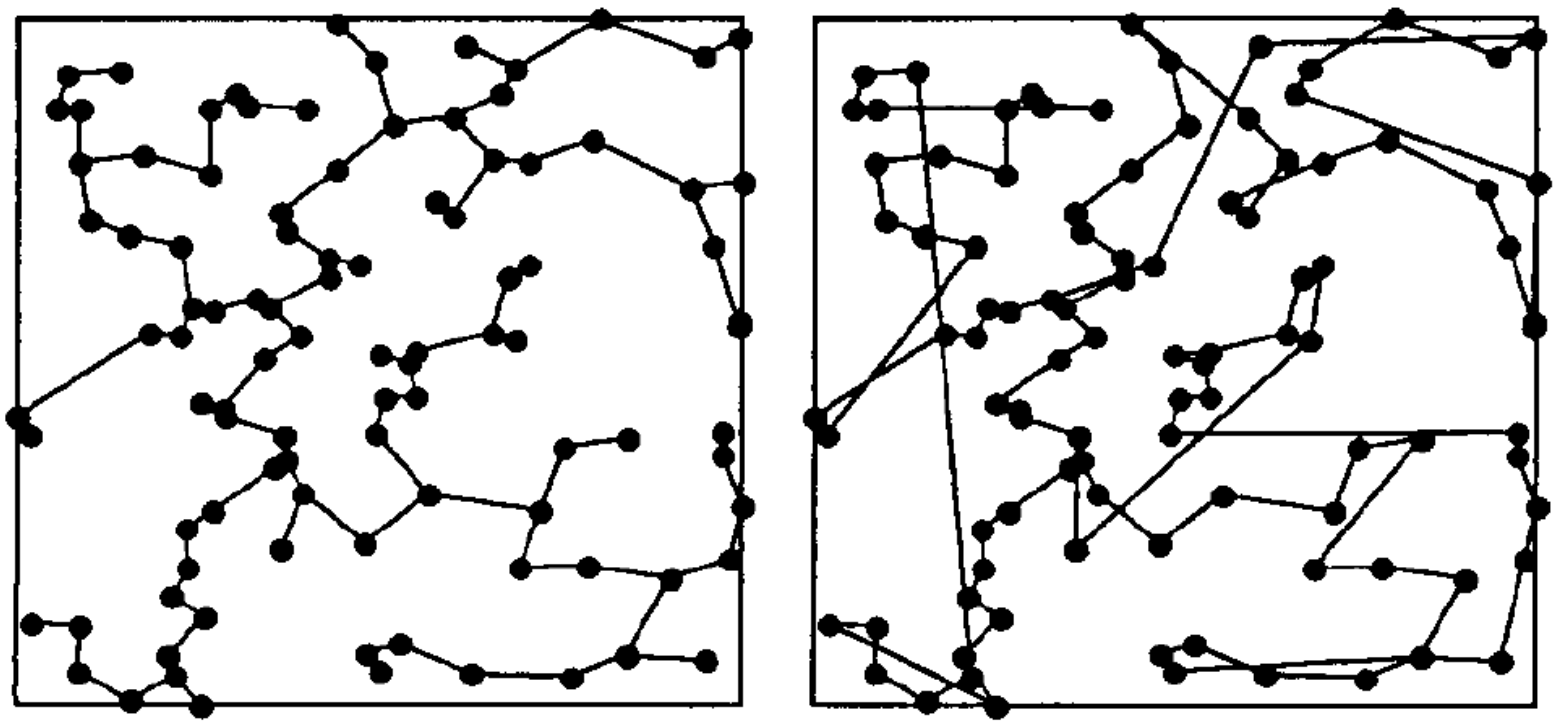

Figure 18. The Minimum Spanning Tree heuristic.

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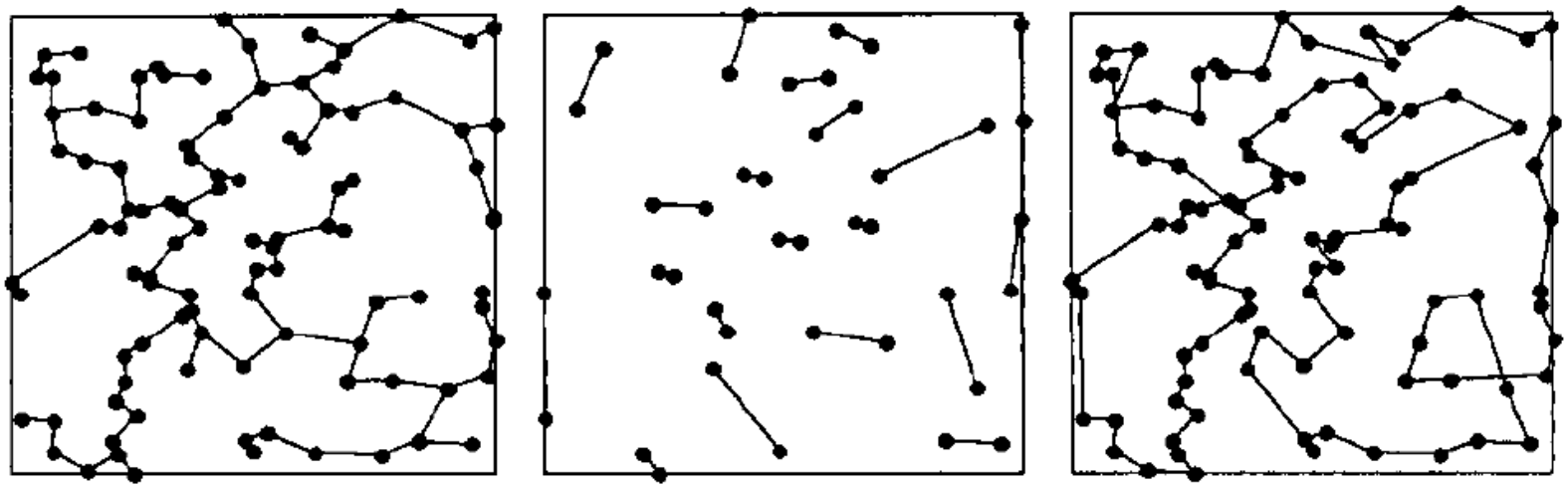

Figure 19. Christofides' heuristic.