

CSCI-4290/6290: Robot Motion Planning
Lecture 24: November 25, 2003
Assembly Planning, and Carton Folding

Announcements

- Please sign up for a time to demo your final course project next week.
- See the course web page for additional information on the course project and guidelines for your project web page.
- The lectures by graduate students are available on the course web page.

Today's Class

Today we will look at applications of motion planning techniques to computer-aided design and automated manufacturing.

1. Assembly planning:

Evan Shechter will talk about motion strategies for *assembly planning*. Assembly planning involves finding a sequence of motions to assemble a product from its component parts, and can be viewed as a particular case of multiple robot coordination.

2. Carton folding:

Carton folding is a packaging task that involves manipulation and motion planning of (non-rigid) hinged objects. By treating the object to be manipulated as an articulated robot, carton folding sequences can be automatically generated. Potential applications include automated packaging and the design of 3D microelectromechanical systems (MEMS) devices.

References

Disassembly Sequencing Using a Motion Planning Approach, Sujay Sundaram, Ian Remmler, and Nancy M. Amato, Proceedings of the 2001 IEEE International Conference on Robotics and Automation, May 2001.

Geometric reasoning about mechanical assembly, R. H. Wilson and J.-C. Latombe, *Artificial Intelligence*, volume 71, number 2, pages 371-396, Dec 1994.

Folding Cartons with Fixtures: A Motion Planning Approach. Liang Lu and Srinivas Akella. *IEEE Transactions on Robotics and Automation*, volume 16, number 4, pages 346-356, August 2000.

Reading

Chapters 11.6 (assembly planning) and 8.3 (articulated robots), Latombe. (optional)

Next Class

Manipulation planning for parts feeding, and Multiple robot coordination.