

CSCI-4290/6290: Robot Motion Planning  
Lecture 8: September 19, 2003  
**Exact Cell Decomposition**

## Today's Class

Today we look at exact cell decomposition methods for motion planning. In particular, we consider the *trapezoidal decomposition* method, an exact cell decomposition method to plan the motion of a translating robot in the plane.

1. Cell decomposition methods
2. Trapezoidal decomposition, and computing using plane sweep
3. Path smoothing

## Reading

Chapter 6–6.1, Choset et al.

Chapter 5.2, *Planning Algorithms* by LaValle.

Chapter 5.1 and Appendix D, Latombe. (optional)

## Additional References

Chapter 13 of *Computational Geometry: Algorithms and Applications*, second edition, by M. de Berg, M. van Kreveld, M. Overmars, and O. Schwarzkopf, Springer, 2000.

Chapter 33 of *Introduction to Algorithms*, second edition, by Cormen, Leiserson, Rivest, and Stein, McGraw Hill/MIT Press, 2001. (Or Chapter 35 of the first edition.)

## Next Class

Approximate cell decomposition.