

# CS686 Motion Planning and Applications

Sung-eui Yoon

IROS 2010, 2009, IJRR, Trob papers are not included yet

## Randomized planners

1. Using Path-Length Localized RRT-Like Search to Solve Challenging Planning Problems  
Wedge, Nathan; Branicky, Michael  
ICRA 11
2. An Efficient Retraction-based RRT Planner  
Liangjun Zhang, Dinesh Manocha  
ICRA 08
3. Anytime RRTs  
Ferguson, D. Stentz, A.  
IROS 06
4. Dynamic-Domain RRTs: Efficient Exploration by Controlling the Sampling Domain  
Anna Yershova, Léonard Jaillet, T. Simelon, S. LaValle  
ICRA 05
5. RRT-Connect: An Efficient Approach to Single-Query Path Planning  
James J. Kuffner, Steven M. LaValle  
ICRA 00

## Kinodynamic trajectories

6. Online Generation of Kinodynamic Trajectories for Non-Circular Omnidirectional Robots  
Sprunk, Christoph, Lau, Boris, Pfaff, Patrick, Burgard, Wolfram  
ICRA 2011
7. Randomized Kinodynamic Planning  
Steven M. LaValle, James J. Kuffner  
ICRA 99

## Social interactions

8. An Anthropomorphic Navigation Scheme for Dynamic Scenarios  
Scandolo, Leonardo; Fraichard, Thierry  
ICRA 2011

## Multiple/temporal goals

9. Planning Curvature-Constrained Paths to Multiple Goals Using Circle Sampling  
Lobaton, Edgar; Zhang, Jinghe; Patil, Sachin; Alterovitz, Ron  
ICRA 11
10. Multi-Goal Feasible Path Planning Using Ant Colony Optimization  
Englot, Brendan; Hover, Franz  
ICRA 11
11. Sampling-Based Motion Planning with Temporal Goals, pp. 2689-2696.  
Bhatia, Amit, Kavraki, Lydia (Rice Univ.), Moshe, Vardi (Rice Univ.)  
ICRA 10

## Acceleration techniques

1. Real-Time Informed Path Sampling for Motion Planning Search  
Knepper and Mason  
ISRR 2011
2. An Equivalence Relation for Local Path Sets  
Ross Knepper, Siddhartha Srinivasa and Matthew Mason  
WAFR 2010

## Movable/deformable objects

12. Cart Pushing with a Mobile Manipulation System: Towards Navigation with Moveable Objects  
Scholz, Jonathan; Marthi, Bhaskara; Chitta, Sachin; Likhachev, Maxim  
ICRA 11
13. Deformable Robot Motion Planning in a Reduced-Dimension Configuration Space  
Mahoney, Arthur; Bross, Joshua (Univ. of Utah), Johnson, David (Univ. of Utah)  
ICRA 10

## Dynamic environments

14. Multipartite RRTs for Rapid Replanning in Dynamic Environments  
Matthew Zucker, James Kuffner, and Michael Branicky  
ICRA 07
15. Replanning with RRTs  
D. Ferguson, N. Kalra, A. Stentz  
ICRA06

16. Roadmap-based motion planning in dynamic environments  
Jur P. van den Berg, Mark H. Overmars  
IEEE Transactions on Robotics, 05
17. Safe motion planning in dynamic environments  
S Petti, T Fraichard  
IROS 05
18. Motion planning using dynamic roadmaps  
M Kallman, M Mataric  
ICRA 2004
19. A PRM-based motion planner for dynamically changing environments  
L Jaillet, T Simeon  
IROS 04
20. Real-time randomized path planning for robot navigation  
Bruce, J. Veloso, M.  
IROS 02

## Multiple agents

21. Multi-Robot System for Artistic Pattern Formation  
Alonso-Mora, Javier; Breitenmoser, Andreas; Rufli, Martin; Siegwart, Roland; Beardsley, Paul  
ICRA 11
22. Decentralized Path Planning for Multi-Agent Teams in Complex Environments Using Rapidly-Exploring Random Trees  
Desaraju, Vishnu; How, Jonathan  
ICRA 11
23. Visibility-Based Deployment of Robot Formations for Communication Maintenance  
Stump, Ethan; Michael, Nathan; Kumar, Vijay; Isler, Volkan  
ICRA 11
24. Multi-Robot Coordination using Generalized Social Potential Fields  
R. Gayle, W. Moss, M. C. Lin, D. Manocha  
ICRA 09
25. Reciprocal Velocity Obstacles for real-time multi-agent navigation  
J Van den Berg, M Lin, D Manocha -  
ICRA 08
26. Reactive deformation roadmaps: Motion planning of multiple robots in dynamic environments  
R Gayle, A Sud, M Lin, D Manocha  
IROS 07
27. Continuum crowds  
A Treuille, S Cooper, Z Popović –

SIGGRAPH 06

28. Big fast crowds on ps3

C Reynolds

Symp. on Videogames 06

29. Multiple path coordination for mobile robots: A geometric algorithm

S Leroy, JP Laumond, T Siméon

Int. Joint Conf. on AI, 99

30. Multiple robot path coordination using artificial potential fields

CW Warren

ICRA 90

## Controlling robots

31. A Robust Qualitative Planner for Mobile Robot Navigation Using Human-Provided Maps

Shah, Danelle; Campbell, Mark

ICRA 11

## Uncertainty in Planning

32. Risky Planning: Path Planning Over Costmaps with a Probabilistically Bounded Speed-Accuracy

Tradeoff

Murphy, Elizabeth; Newman, Paul

ICRA 11

33. Motion Planning under Uncertainty using Differential Dynamic Programming in Belief Space

van der Berg, Patil and Alterovitz

ISRR 2011

34. A Tuned Approach to Feedback Motion Planning with RRTs under Model Uncertainty

Maeda, Guilherme Jorge; Singh, Surya; Durrant-Whyte, Hugh

ICRA 11

35. Adaptive Time Stepping in Real-Time Motion Planning

Kris Hauser

WAFR 2010

36. Randomized Belief-Space Replanning in Partially-Observable Continuous Spaces

Kris Hauser

WAFR 2010

## Planning with different scene representations

37. Path Planning in Belief Space with Pose SLAM

Valencia, Rafael; Andrade-Cetto, Juan; Porta, Josep M

ICRA 11

38. Navigation in Hybrid Metric-Topological Maps

Konolige, Kurt; Marder-Eppstein, Eitan; Marthi, Bhaskara

ICRA 11

## Planning with constraints

39. Path Planning with Loop Closure Constraints using and Atlas-based RRT

Jaillet and Porta

ISRR 2010

## Collision queries

40. GPU-based Parallel Collision Detection for Real-Time Motion Planning

Jia Pan and Dinesh Manocha

WAFR 2010

41. CCQ: Efficient Local Planning using Connection Collision Query

Min Tang, Young J. Kim and Dinesh Manocha.

WAFR 2010

42. Continuous Collision Detection for Non-Rigid Contact Computations Using Local Advancement

Tang, Min; Kim, Young J. (Ewha Womans Univ.), Manocha, Dinesh (UNC at Chapel Hill)

ICRA 2010

## Nonholonomic systems

43. A Quadratic Regulator-Based Heuristic for Rapidly Exploring State Space

Glassman, Elena Leah; Tedrake, Russ (Massachusetts Inst. of Tech.)

ICRA 10

## Collision avoidance

44. Reciprocal Collision Avoidance with Acceleration-Velocity Obstacles

van den Berg, Jur; Snape, Jamie; Guy, Stephen J.; Manocha, Dinesh

ICRA 11

45. Inevitable Collision States: A Probabilistic Perspective, pp. 4022-4027.

Bautin, Antoine; Martinez-Gomez, Luis (INRIA), Fraichard, Thierry (INRIA)

ICRA 10

## Parallel Planning

46. Parallelizing RRT on Distributed-Memory Architectures

Devaurs, Didier; Simeon, Thierry; Cortes, Juan

ICRA 11

47. High-Dimensional Planning on the GPU

Kider Jr., Joseph T. et al.

ICRA 10

## Task planning

48. Hierarchical Planning in the Now

Kaelbling, Leslie; Lozano-Perez, Tomas

ICRA 2011

## Optimality

49. Asymptotically near-optimal is good enough for motion planning

Marble and Bekris

ISRR 2011

50. Anytime Motion Planning Using the RRT<sup>^\*</sup>

Karaman, Sertac; Walter, Matthew; Perez, Alejandro; Frazzoli, Emilio; Teller, Seth

ICRA 2011

51. Rapidly-Exploring Roadmaps: Weighing Exploration vs. Refinement in Optimal Motion Planning

Alterovitz, Ron; Patil, Sachin; Derbakova, Anna

ICRA 2011

## Humanoid robots

52. Autonomous navigation for a humanoid robot on unknown rough terrain

Nishiwaki

ISRR 2011

53. Retraction-Based RRT Planner for Articulated Model

Pan, Jia, Zhang, Liangjun, Manocha, Dinesh (UNC at Chapel Hill)

ICRA 10

## Traffic/car simulation

54. A Vehicle Model for Micro-Traffic Simulation in Dynamic Urban Scenarios

Xu, Wenda; Yao, Wen; Zhao, Huijing; Zha, Hongbin

ICRA 2011

55. Unified Path Planner for Parking an Autonomous Vehicle Based on RRT

Han, Long; Do, Quoc Huy; Mita, Seiichi

ICRA 11

## Metrics for motion planning

56. Learning Approximate Cost-To-Go Metrics to Improve Sampling-Based Motion Planning

Li, Yanbo; Bekris, Kostas E.

ICRA 2011

## Manipulation planning

57. STOMP: Stochastic Trajectory Optimization for Motion Planning

Kalakrishnan, Mrinal; Chitta, Sachin; Theodorou, Evangelos; Pastor, Peter; Schaal, Stefan

ICRA 11

58. Addressing Cost-Space Chasms in Manipulation Planning

Berenson, Dmitry; Simeon, Thierry; Srinivasa, Siddhartha

ICRA 11

59. Understanding and Executing Instructions for Everyday Manipulation Tasks from the World Wide Web

Tenorth, Moritz, Nyga, Daniel, Beetz, Michael (Tech. Univ. München)

ICRA 10

## Reactive and sensor-based planning

60. Tactile-Based Motion Adjustment for the Nursing-Care Assistant Robot RIBA

Mukai, Toshiharu et al.

ICRA 11

61. Reactive Robot Motion Using Path Replanning and Deformation

Yoshida, Eiichi; Kanehiro, Fumio

ICRA 11

## Safe planning

62. SIPP: Safe Interval Path Planning for Dynamic Environments

Phillips, Mike; Likhachev, Maxim

ICRA 11

63. Asynchronous Distributed Motion Planning with Safety Guarantees under Second-Order Dynamics

Devin K. Grady, Kostas E. Bekris and Lydia E. Kavraki

WAFR 2010