

Policies Based on Trajectory Libraries

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Abstract: We present a control approach that uses a library of trajectories to establish a global control law or policy. This is an alternative to methods for finding global policies based on value functions using dynamic programming and also to using plans based on a single desired trajectory. Our method has the advantage of providing reasonable policies much faster than dynamic programming can provide an initial policy. It also has the advantage of providing more robust and global policies than following a single desired trajectory.

Trajectory libraries can be created for robots with many more degrees of freedom than what dynamic programming can be applied to as well as for robots with dynamic model discontinuities. Results are shown for the "Labyrinth" marble maze and the Little Dog quadruped robot. The marble maze is a difficult task which requires both fast control as well as planning ahead. In the Little Dog terrain, a quadruped robot has to navigate quickly across small-scale rough terrain.

References

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- [2] Martin Stolle. Policies based on Libraries. CMU Thesis Proposal.