



From Logistics to Drones: Customized Controllers for Autonomous Systems

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Planning in Artificial Intelligence is the problem of finding action strategies, typically executed by intelligent software agents, autonomous robots, or unmanned vehicles. Given a description of the world, a set of actions that an agent is capable of performing, and some desired goal or objective, the solution to a planning problem is a policy – a mapping from states to actions – that the agent can execute to achieve the goal. There is often uncertainty in the task either because the world is not modeled precisely, or because action outcomes are intrinsically uncertain or outside the control of the agent. For example, a slippery road or strong wind can affect the movement of a vehicle. In this work we address the class of Probabilistic Planning problems, where the outcomes of the actions are non-deterministic and may follow a probabilistic transition model. In particular, we focus on finding policies that maximize the probability of reaching a prescribed goal. Our algorithm, Prob-PRP, outperforms the state of the art, computing substantially more robust policies orders of magnitude faster than the state of the art.

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