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## Robot Navigation in Uncertain Environments

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Autonomy is a key factor in robotics that gives it the potential to be a world-shaping tool. One of the challenges we tackle as researchers is how to create robots that can make good decisions in the face of uncertainty. Robots often need to navigate environments where paths may be blocked or unknown, like forest trails hidden by dense terrain or warehouses that change layout as stock gets moved around. Real-world problems are big and difficult to plan for, especially when a robot has limited computing power. In this work, we took a robot into a forest and tasked it with navigating a complex, partially unknown environment where obstacles might be unseen. We developed a planning method that creates compact, reusable decision-making policies in advance. This means the robot can change tactics when its path turns out to be blocked, even when it cannot plan on the fly. In this scenario, our approach achieved a 95% success rate, while other methods had much lower success or entirely failed to create a plan under the same time limits. This work is important in paving the way towards reliable robot navigation in complex, uncertain environments with limited computational resources.

### Confirm eligibility

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