

Optimal Convex Cover as Collision-free Space Approximation for Trajectory Generation

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Motivation

- The identification of a collision-free region significantly impacts trajectory optimization, and no previous works address the optimality, accuracy, and quality of convex cover from a trajectory perspective.

Method

- We propose an online iterative algorithm to find a suitable convex cover to under-approximate the free space for autonomous flight in order to delineate Safe Flight Corridors (SFC).

Result

- Our approach is validated in parameterized environments, showcasing its flexibility and robustness.

Future work

- Convex cover for whole-body $SE(n)$ trajectory planning with an initial set of rigid bodies.

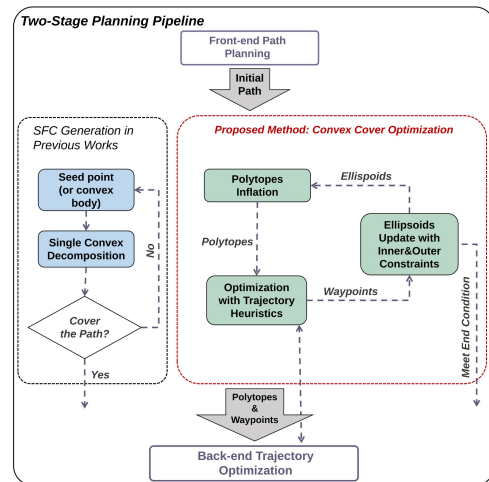


Fig1: System architecture in two-stage planning

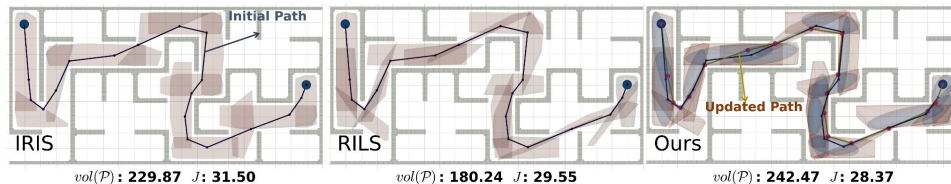


Fig2: Comparison of convex covers in terms of polytope volumes and trajectory cost