Offloading of Time-Optimal Motion Planning with Jerk Constraints

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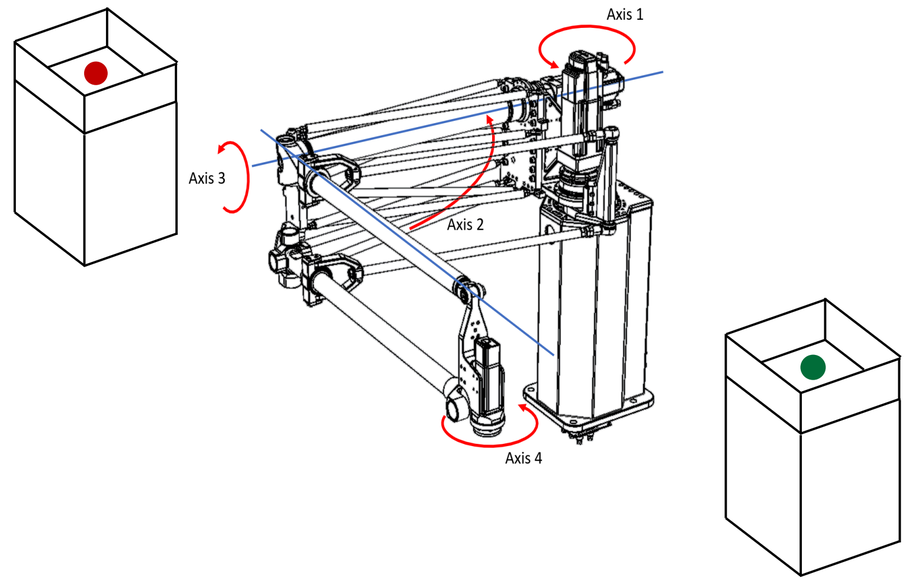
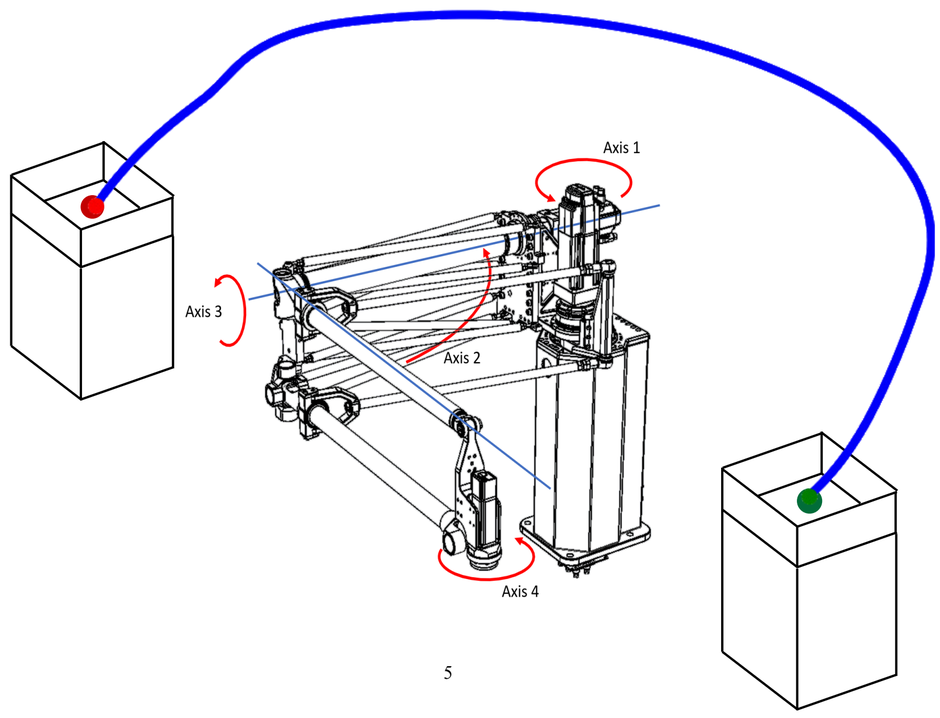
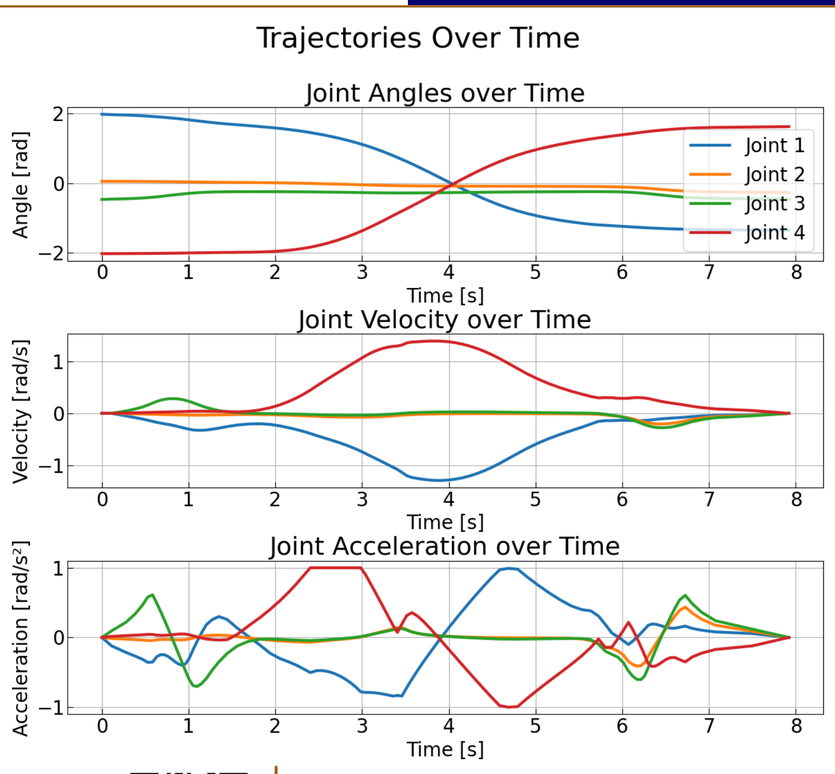
- **Move the HKM from starting to end position**
- **Ensure time-optimal motion**
- **Avoid obstacles**
- **Respect jerk constraints**



- **Start, end points, and obstacles are provided to OMPL**
- **CForest is used to find the shortest path [1]**
- **CForest runs multiple RRT* instances in parallel for faster searches**

Path Planning with OMPL

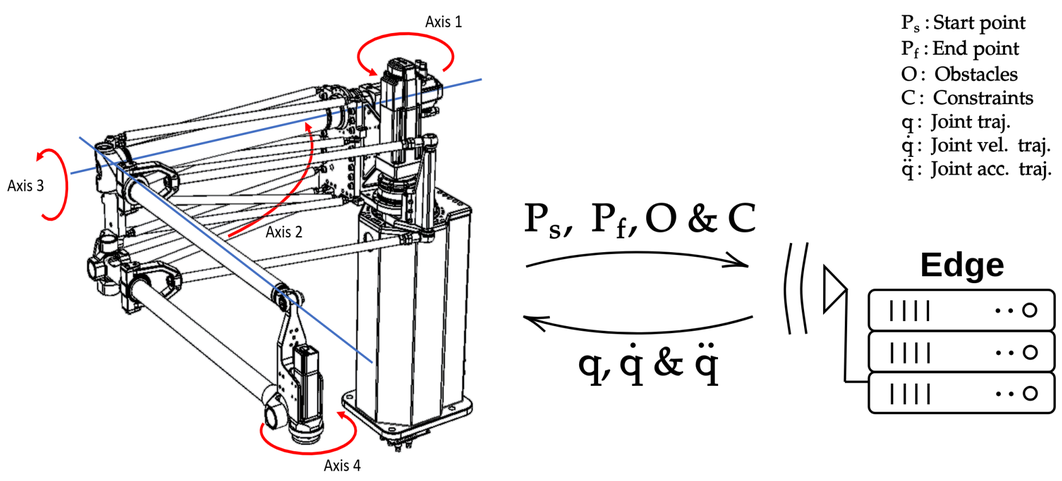




Simulation video

Trajectory Planning with CasADi

- **The path was used in a convex optimization formulation**
- **The formulation was inspired by [2]**
- **Resulted in time-optimal trajectories for joint angles, velocities, and accelerations.**



- **Offload motion planning to a remote server (Edge)**
- **Test the planner on a real HKM**
- **Write a paper**

Future Work

[1] M. Otte and N. Correll " C-FOREST: Parallel Shortest Path Planning With Superlinear Speedup"
[2] D. Verscheure, B. Demeulenaere, J. Swevers, J. De Schutter and M. Diehl, "Time-Optimal Path Tracking for Robots: A Convex Optimization Approach"

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