Experiment 2025-09-16_12-27-08_defaultNarrowPassage2D

Planner Developer Tools (PDT)

September 16, 2025

1 Overview

This report was automatically generated using Planner Developer Tools (PDT). It presents the results for the `2025-09-16_12-27-08_defaultNarrowPassage2D` experiment, which executed 100 runs of Informed HZ, and Informed RRT* on the `defaultNarrowPassage2D` planning context. See appendix A.1 for more information about the experiment setup.

1.1 Results Summary

Planner	$t^{\text{min}}_{\text{init}}$	$t^{\text{med}}_{\text{init}}$	$t^{\text{max}}_{\text{init}}$	$c^{\text{min}}_{\text{init}}$	$c^{\text{med}}_{\text{init}}$	$c^{\text{max}}_{\text{init}}$	$c^{\text{min}}_{\text{final}}$	$c^{\text{med}}_{\text{final}}$	$c^{\text{max}}_{\text{final}}$	Success
Informed HZ	0.0073	**0.0284**	∞	**0.4410**	**0.5562**	∞	0.4410	0.5174	∞	**0.92**
Informed RRT*	**0.0067**	0.0673	∞	0.4444	0.5568	∞	**0.4286**	**0.4968**	∞	0.70

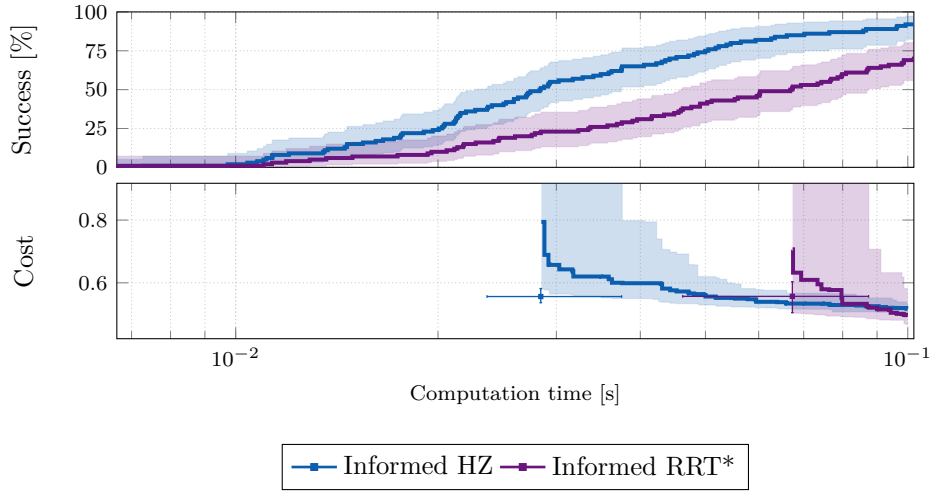

Figure 1: **Top:** Percentage of runs that found a solution at any given time with a Clopper-Pearson (nonparametric) 99% confidence interval. **Bottom:** Median cost evolution and median of initial solution with nonparametric 99% confidence intervals.

1.2 Initial Solutions

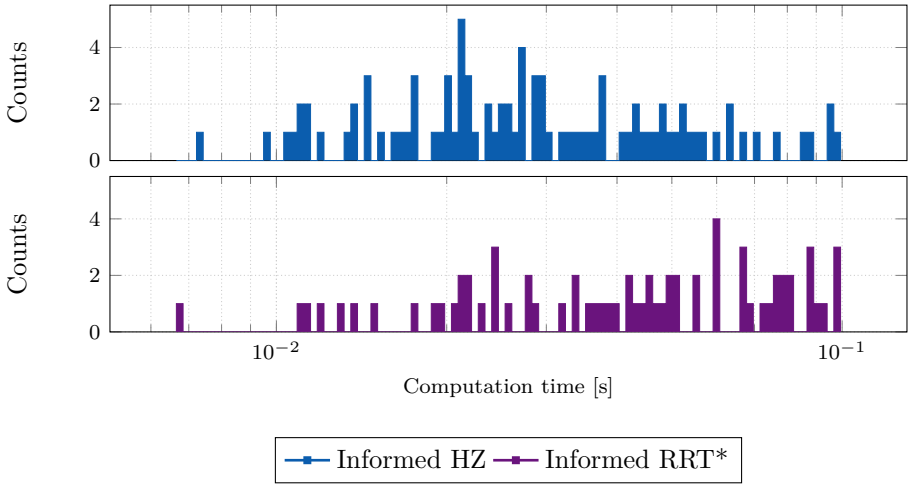

Figure 2: Histograms of initial solution times.

2 Informed HZ

2.1 Initial Solutions

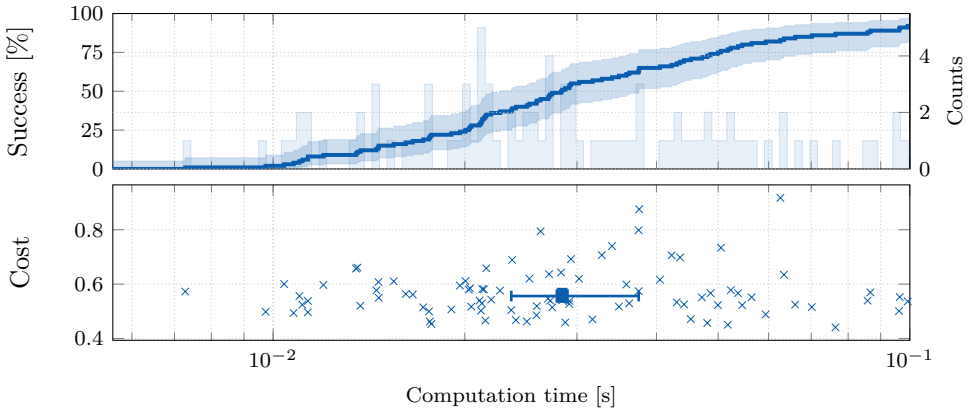

Figure 3: **Top:** Histogram and associated empirical distribution function (EDF) of Informed HZ with a Clopper-Pearson (nonparametric) 99% confidence interval for the underlying CDF. **Bottom:** All initial solutions of Informed HZ and their median with a nonparametric 99% confidence interval.

2.2 Cost Evolution

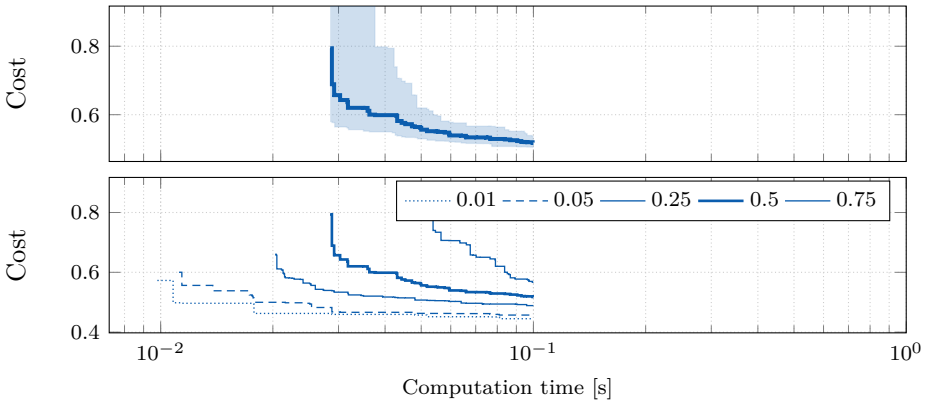

Figure 4: **Top:** Median cost evolution of Informed HZ with a nonparametric 99% confidence interval. **Bottom:** Seven percentiles of the cost evolution of Informed HZ.

3 Informed RRT*

3.1 Initial Solutions

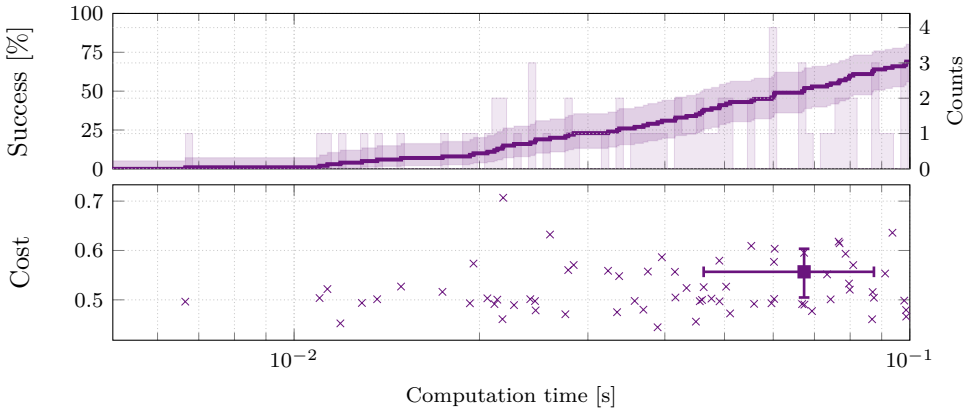

Figure 5: **Top:** Histogram and associated empirical distribution function (EDF) of Informed RRT* with a Clopper-Pearson (nonparametric) 99% confidence interval for the underlying CDF. **Bottom:** All initial solutions of Informed RRT* and their median with a nonparametric 99% confidence interval.

3.2 Cost Evolution

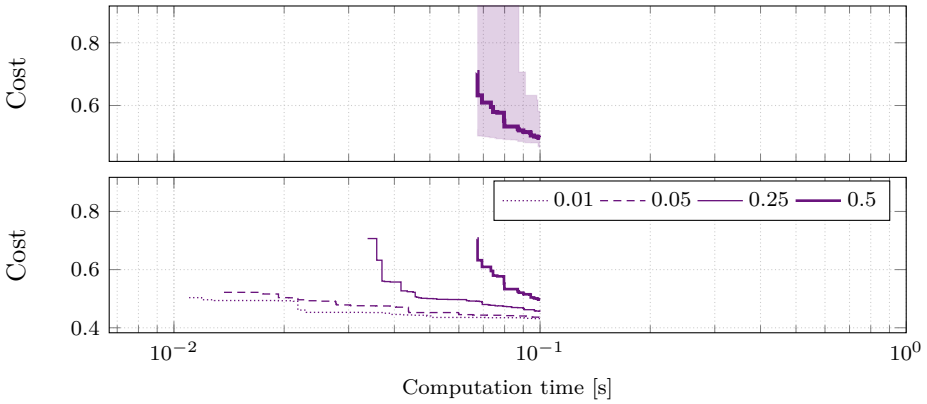

Figure 6: **Top:** Median cost evolution of Informed RRT* with a nonparametric 99% confidence interval. **Bottom:** Seven percentiles of the cost evolution of Informed RRT*.

A Configuration

A.1 Experiment


```
{
  "baseDirectory": "/home/ubuntu/Desktop/hzmp_project/pdt/build/benchmarks/",
  "context": "defaultNarrowPassage2D",
  "executable": "benchmark",
  "experimentDirectory": "/home/ubuntu/Desktop/hzmp_project/pdt/build/benchmarks/2025-09-16_12-27-08_defaultNarrowPassage2D",
  "loadDefaultContextConfig": true,
  "loadDefaultObjectiveConfig": true,
  "loadDefaultPlannerConfig": true,
  "loadDefaultReportConfig": true,
  "logFrequency": 10000,
  "maxTime": 0.2,
  "name": "2025-09-16_12-27-08_defaultNarrowPassage2D",
  "numRuns": 100,
  "objective": "defaultPathLength",
  "planners": [
    "defaultInformedHZ",
    "defaultInformedRRTstar"
  ],
  "results": [
    "/home/ubuntu/Desktop/hzmp_project/pdt/build/benchmarks/2025-09-16_12-27-08_defaultNarrowPassage2D/raw/results_0.csv"
  ],
  "seed": 10981397665449740,
  "useOnlyThisConfig": true
}
```


A.2 defaultNarrowPassage2D


```
{
  "boundarySideLengths": [
    1,
    1
  ],
  "collisionCheckResolution": 5e-06,
  "dimensions": 2,
  "goal": [
    0.2,
```

```
    0.0
  ],
  "goalType": "GoalState",
  "maxTime": 0.1,
  "objective": "defaultPathLength",
  "passageOffset": 0.1,
  "passageWidth": 0.1,
  "start": [
    -0.2,
    0.0
  ],
  "type": "NarrowPassage",
  "wallOffset": 0.0,
  "wallThickness": 0.2
}
```

A.3 Informed HZ

```
{
  "isAnytime": true,
  "options": {
    "goalBias": 0.05,
    "maxEdgeLength": {
      "2d": 0.1,
      "3d": 0.1,
      "4d": 0.1,
      "5d": 0.1,
      "6d": 0.1,
      "7d": 0.1,
      "8d": 0.1
    },
    "numSamplingAttempts": 100,
    "rewireFactor": 1.1,
    "useKNearest": true
  },
  "parameters": {
    "bounds": "-0.5 0.5 -0.5 0.5",
    "goal": "0.2 0.0",
    "obstacles": "-0.5 -0.5,0.5 -0.5,0.5 0.05,-0.5 0.05;
       -0.5 0.15,0.5 0.15,0.5 0.5,-0.5 0.5",
    "start": "-0.2 0.0"
  },
  "params": {
    "bounds": "-0.5 0.5 -0.5 0.5",
    "goal": "0.2 0.0",
```

```
    "obstacles": "-0.5 -0.5,0.5 -0.5,0.5 0.05,-0.5 0.05;
        -0.5 0.15,0.5 0.15,0.5 0.5,-0.5 0.5",
    "start": "-0.2 0.0"
  },
  "report": {
    "color": "pdtblue",
    "name": "Informed HZ"
  },
  "type": "InformedHZ"
}
```

A.4 Informed RRT*

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{
  "isAnytime": true,
  "options": {
    "goalBias": 0.05,
    "maxEdgeLength": {
      "12d": 2.0,
      "14d": 2.4,
      "16d": 3.0,
      "2d": 0.3,
      "32d": 7.0,
      "3d": 0.4,
      "4d": 0.5,
      "6d": 0.9,
      "8d": 1.25
    },
    "numSamplingAttempts": 1,
    "rewireFactor": 1.001,
    "useKNearest": false
  },
  "report": {
    "color": "pdtpurple",
    "name": "Informed RRT*"
  },
  "type": "InformedRRTstar"
}
```