

# Meeting

## 07/21/2020

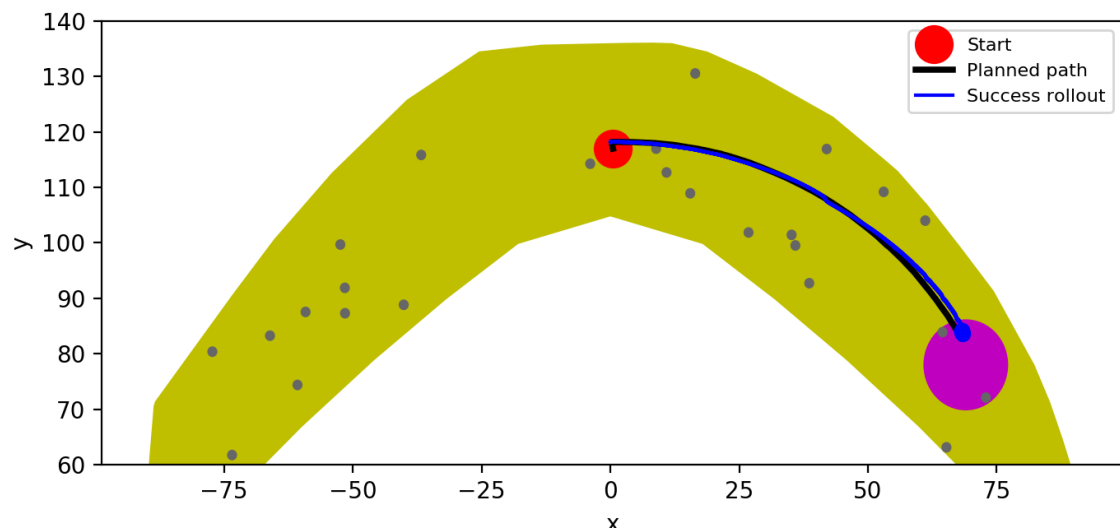
Shuo Zhang

# In past 4 days

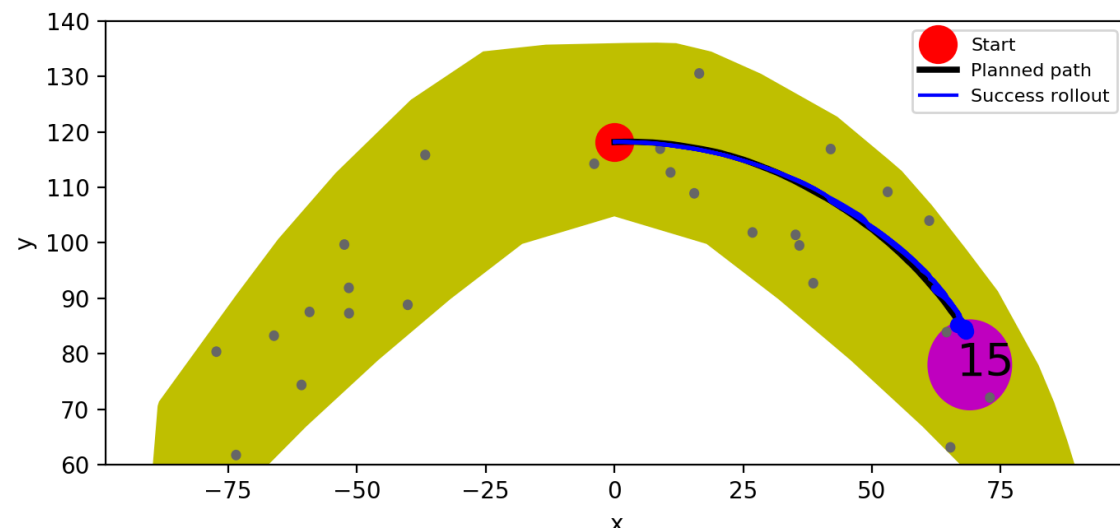
- 1) Data efficiency for Gazebo Hand (1 goal location)
- 2) Data efficiency for Reacher (all 3 goal locations)

# Gazebo Hand Statistics (Goal Location 15)

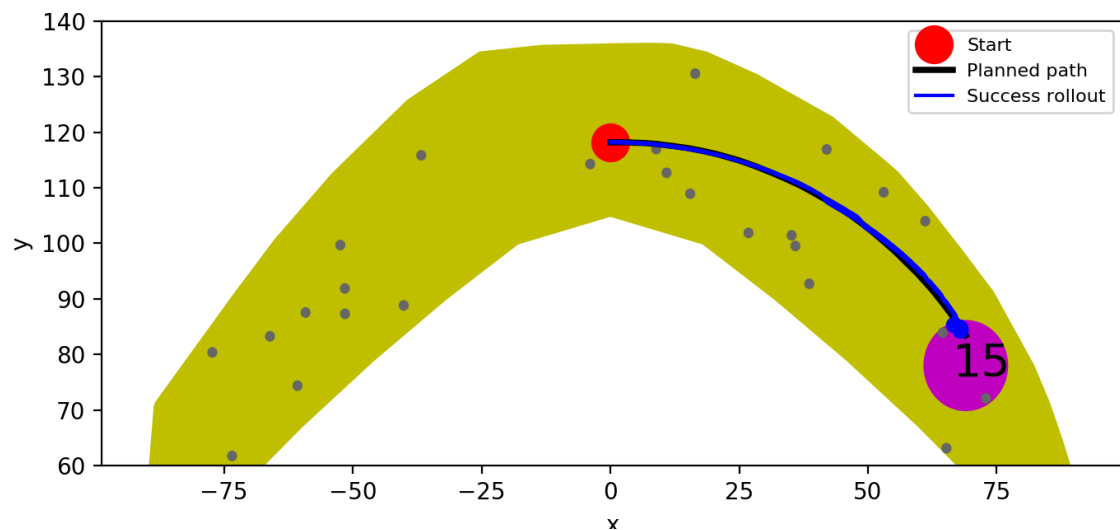
goal location (method) (data size)	success rollout rate	goal reach rate	success rollout path RMSE relative to plan path [mm]	path length [mm]			number of path steps		last distance to goal [mm]		
				plan	success rollout	failure	plan	failure	plan	success rollout	failure
15 (A*) (Full)	100%	100%	1.01±0.01	80.85	80.71±0.14	-	436	-	5.46	6.08±0.16	-
15 (A*) (50%)	100%	100%	0.88±0.04	80.23	80.74±0.95	-	433	-	5.37	6.64±0.37	-
15 (A*) (40%)	100%	100%	0.75±0.05	80.45	80.11±0.50	-	431	-	5.47	6.88±0.32	-
15 (A*) (30%)	100%	100%	1.08±0.05	81.74	83.01±0.69	-	445	-	5.41	4.38±0.23	-
15 (A*) (20%)	100%	100%	0.82±0.03	81.41	82.08±0.70	-	440	-	5.40	5.13±0.20	-
15 (A*) (10%)	100%	100%	0.99±0.05	84.77	84.74±0.69	-	652	-	5.50	3.78±0.11	-
15 (A*) (5%)	100%	100%	1.78±0.09	83.99	86.07±0.71	-	469	-	5.46	2.67±0.10	-
15 (A*) (1%)	100%	100%	3.32±0.02	101.37	97.19±0.08	-	552	-	5.49	2.03±0.10	-



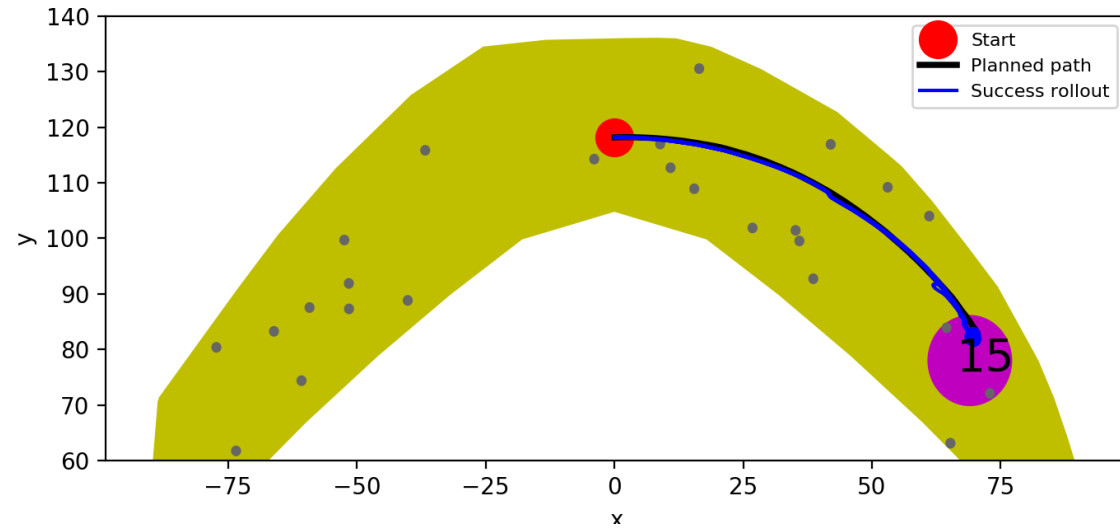
Full



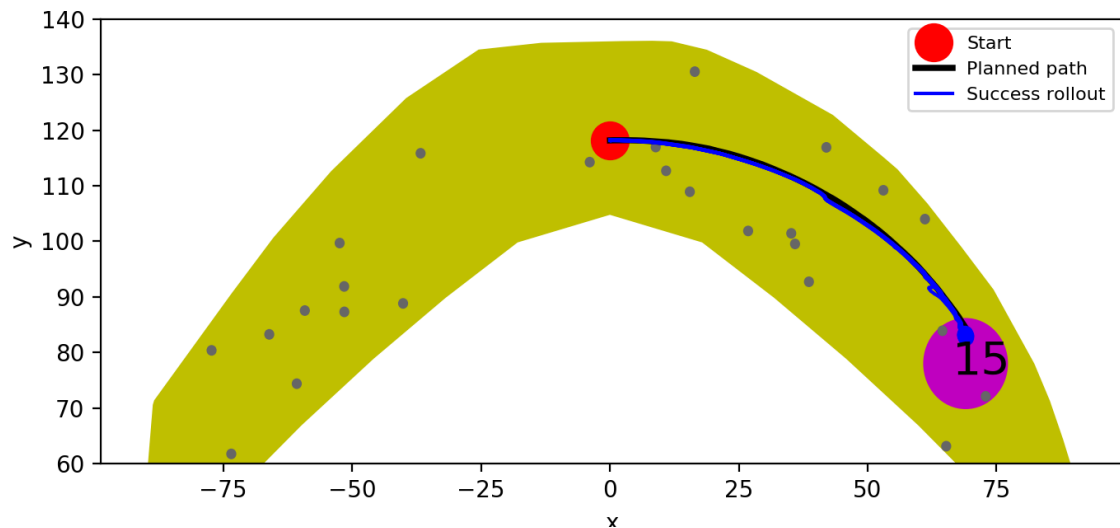
50%



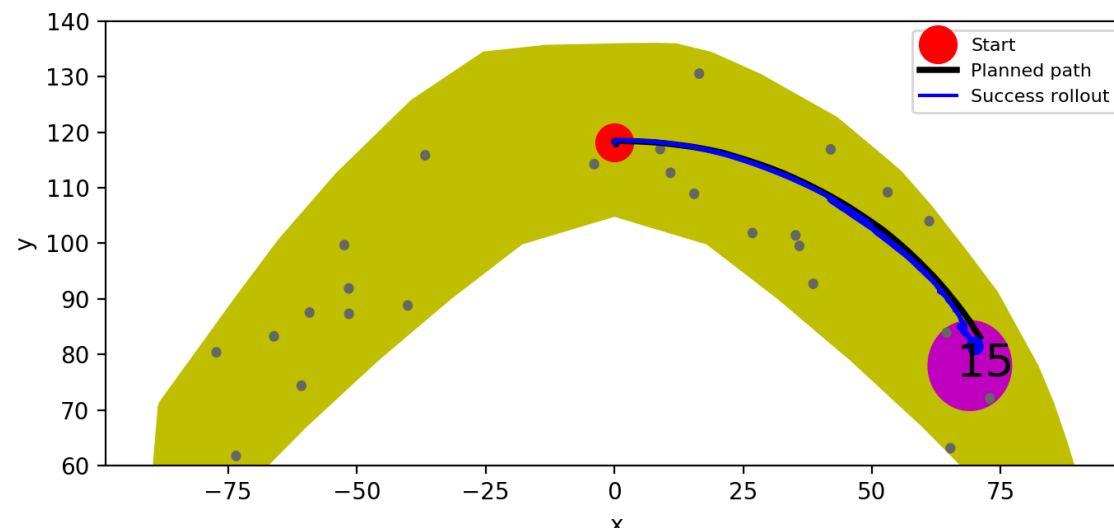
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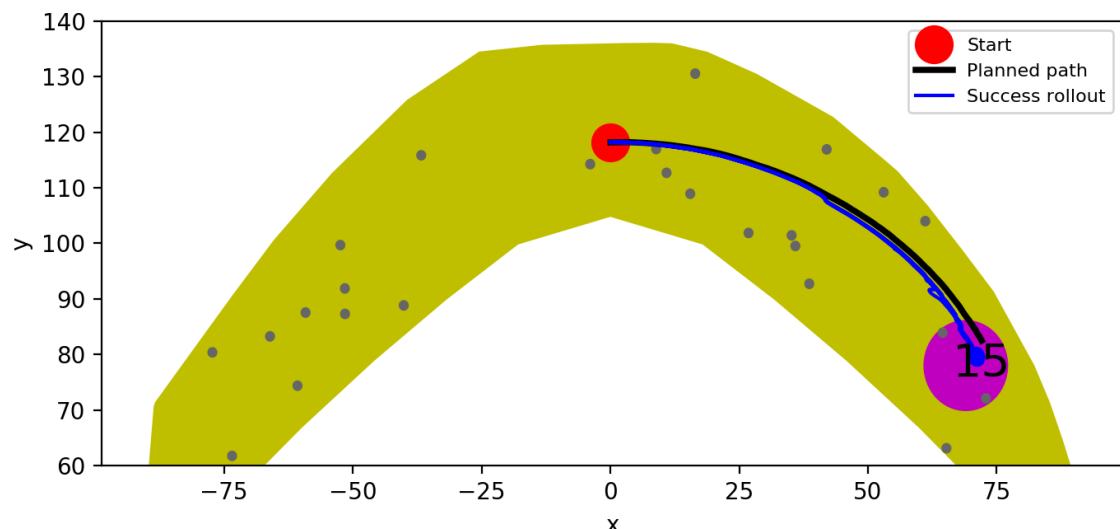
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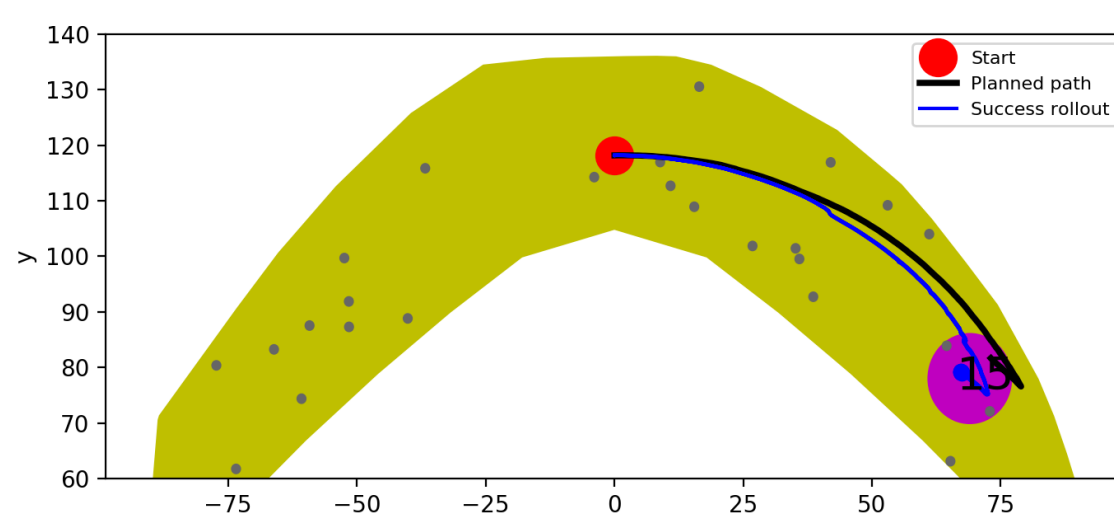
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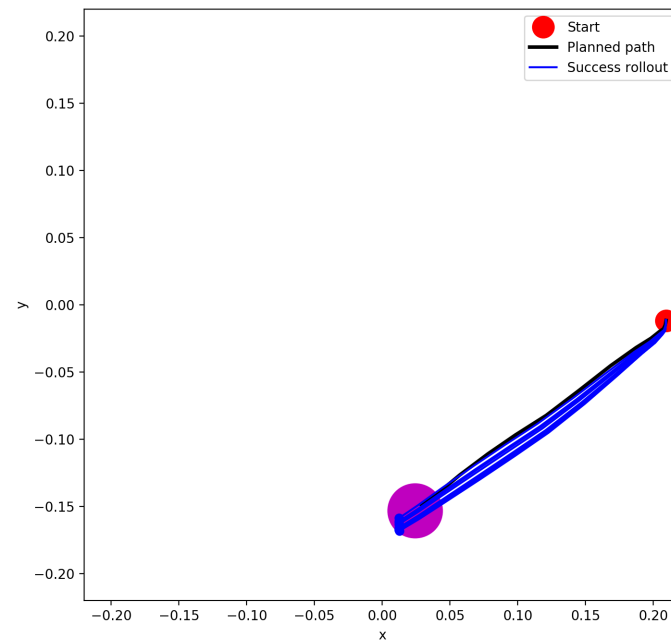
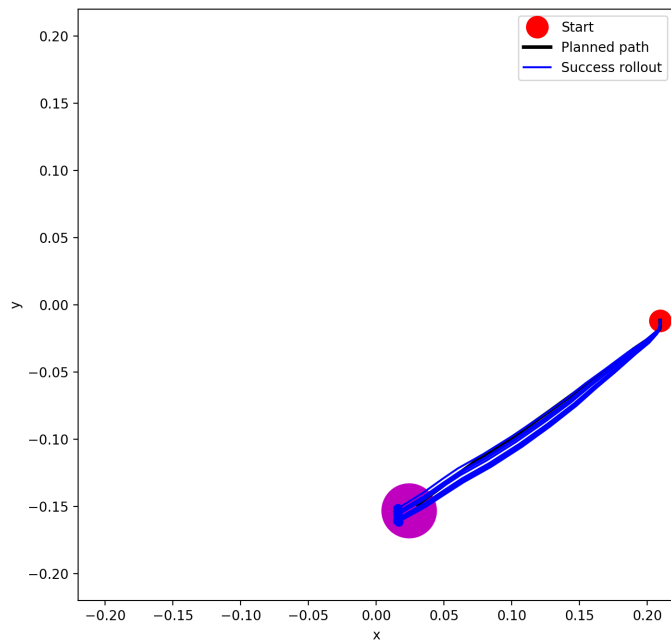
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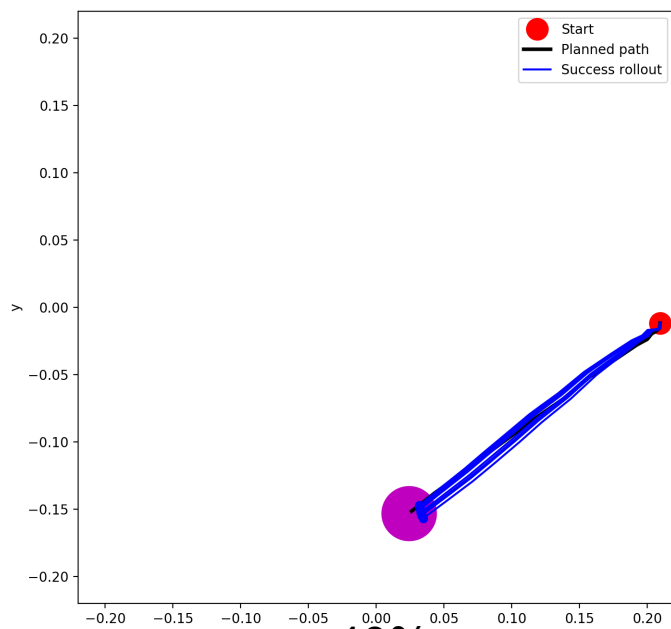
1%

# Reacher Statistics (Goal Location 1)

goal location (method) (data size)	goal reach rate	rollout path RMSE relative to plan path [mm]	path length [mm]		number of path steps	last distance to goal [mm]	
			plan	rollout		plan	rollout
1 (A*) (Full)	100%	0.01025±0.00091	0.22799	0.24568±0.00221	16	0.00778	0.00993±0.00112
1 (A*) (50%)	100%	0.01261±0.00138	0.22831	0.25237±0.00216	14	0.00639	0.01662±0.00195
1 (A*) (40%)	100%	0.00409±0.00072	0.23242	0.22773±0.00120	20	0.00254	0.00931±0.00059
1 (A*) (30%)	0%	0.01242±0.00121	0.22347	0.20847±0.00054	21	0.01164	0.04026±0.00147
1 (A*) (20%)	100%	0.00542±0.00136	0.22386	0.22738±0.00148	16	0.01200	0.00883±0.00151
1 (A*) (10%)	100%	0.00590±0.00178	0.22312	0.22686±0.00189	17	0.01159	0.00997±0.00113
1 (A*) (5%)	0%	0.02607±0.00156	0.22650	0.19342±0.00017	27	0.00916	0.06306±0.00278
1 (A*) (1%)	100%	0.00927±0.00162	0.23205	0.24439±0.00219	18	0.00307	0.00941±0.00282

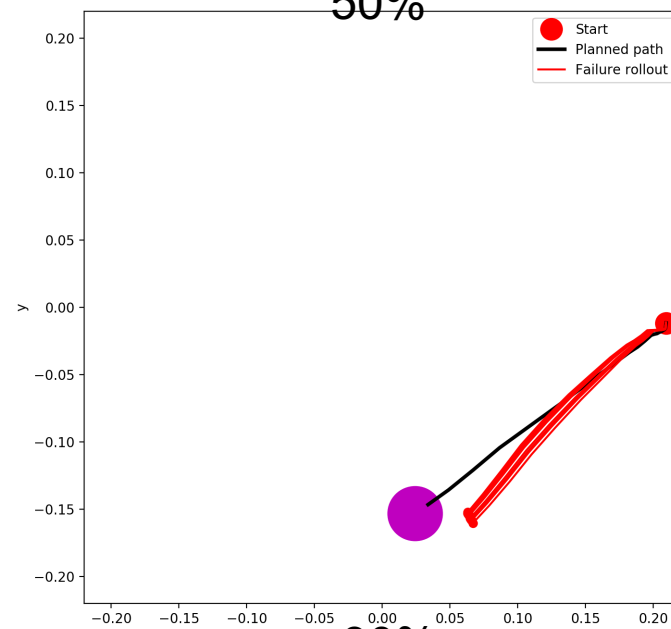


Full

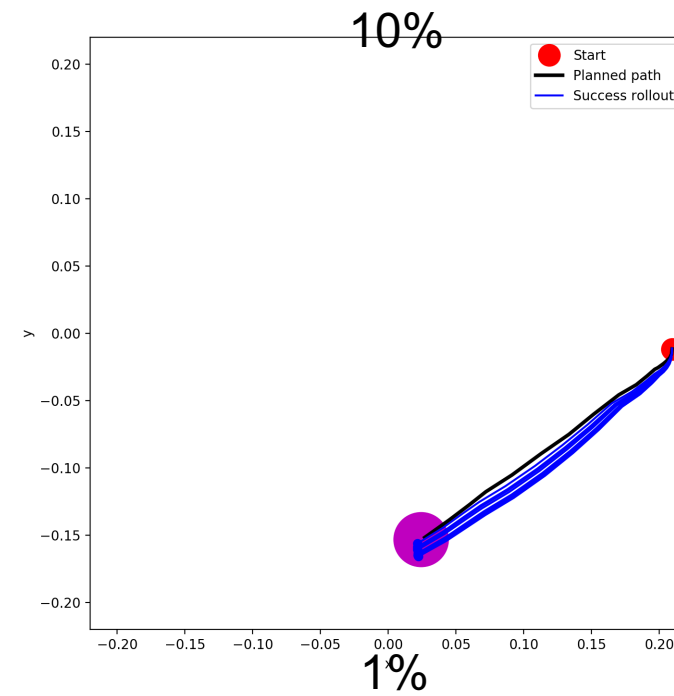
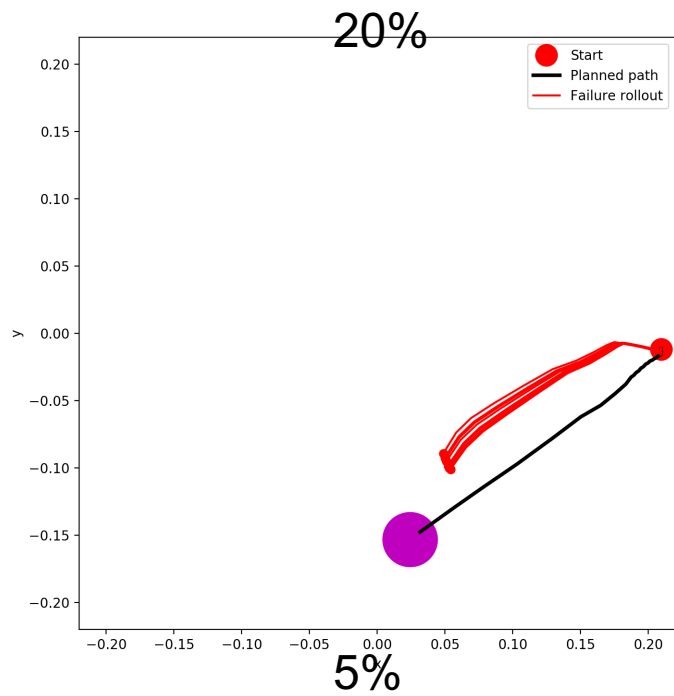
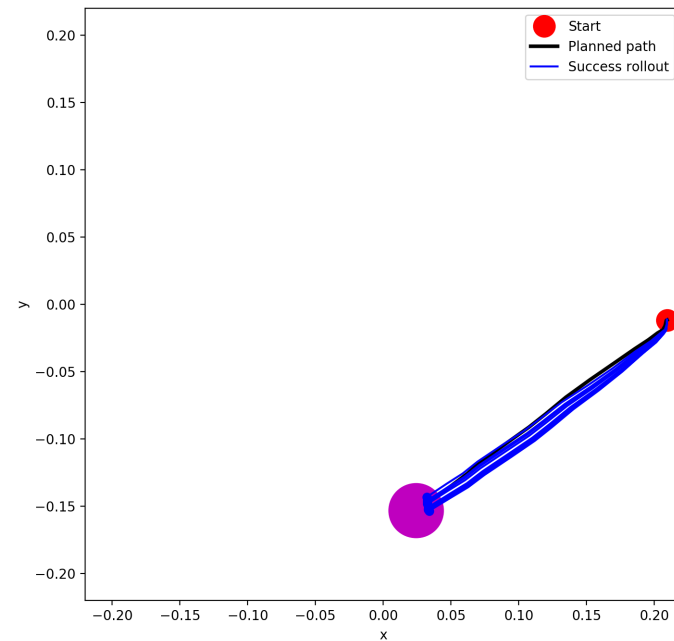
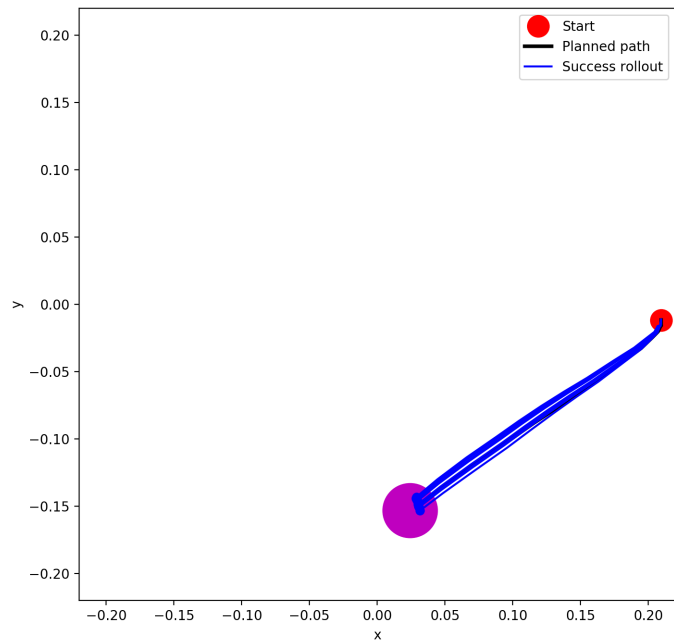


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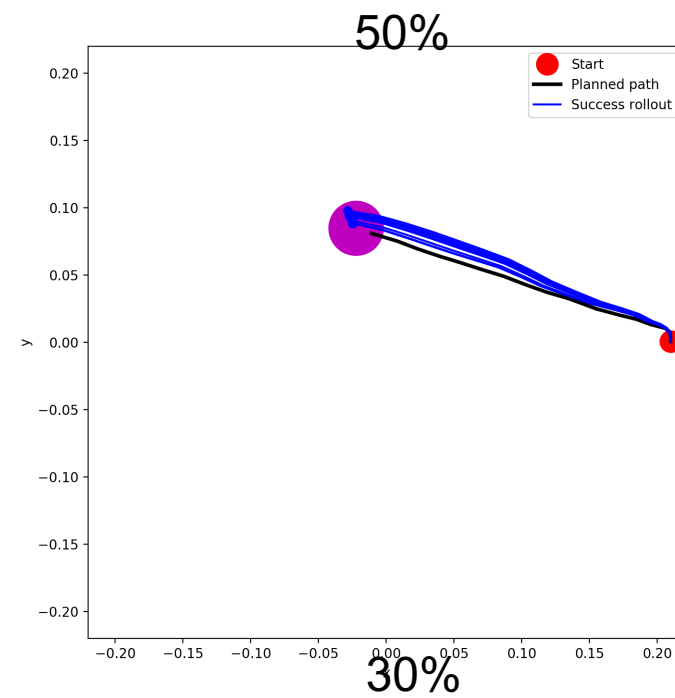
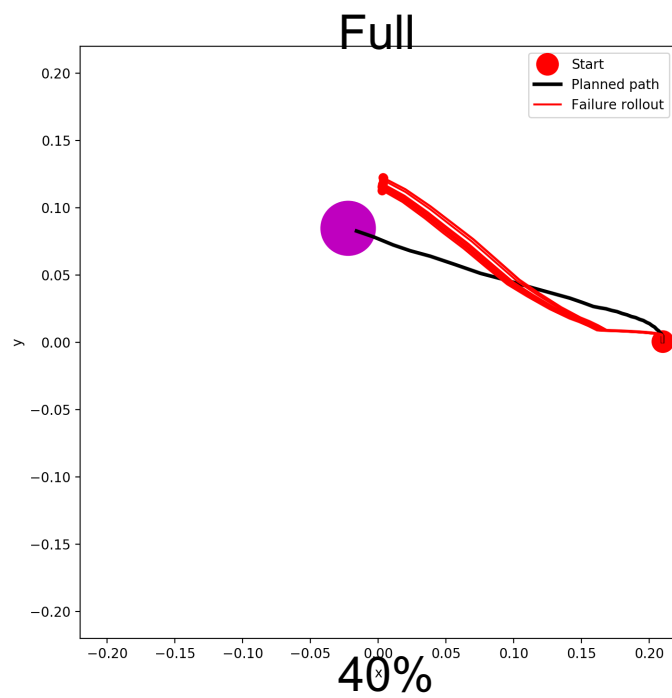
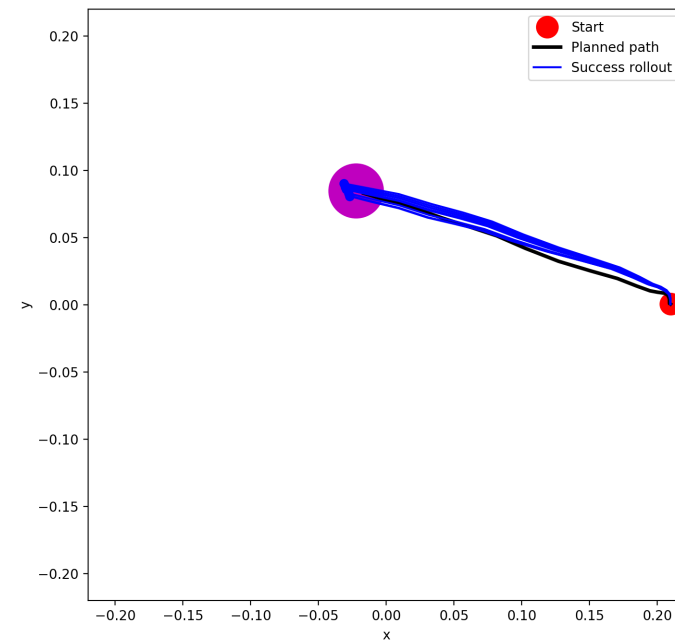
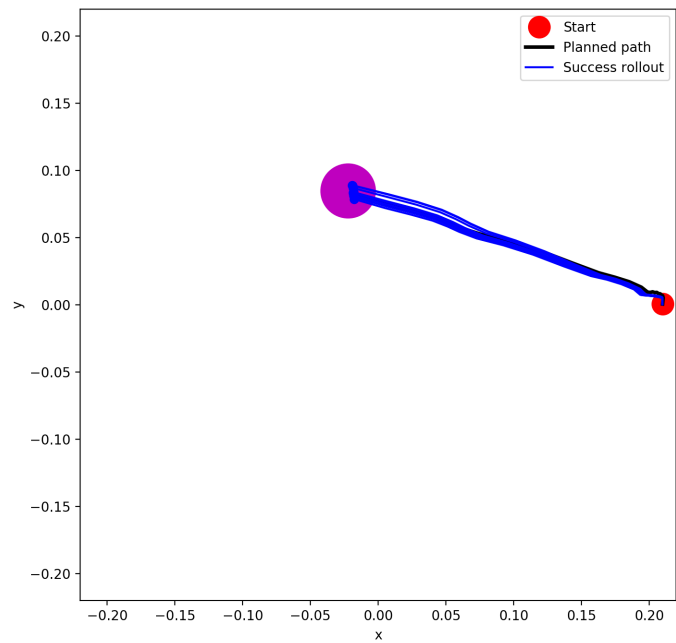
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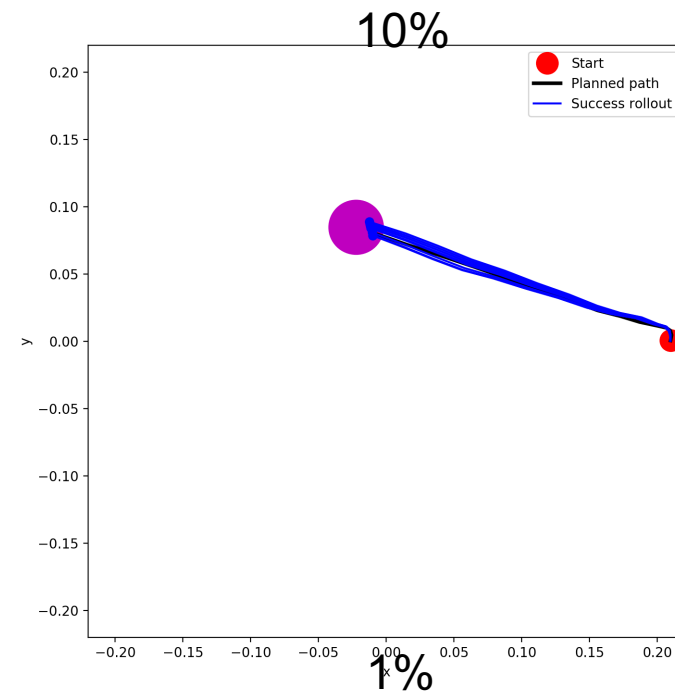
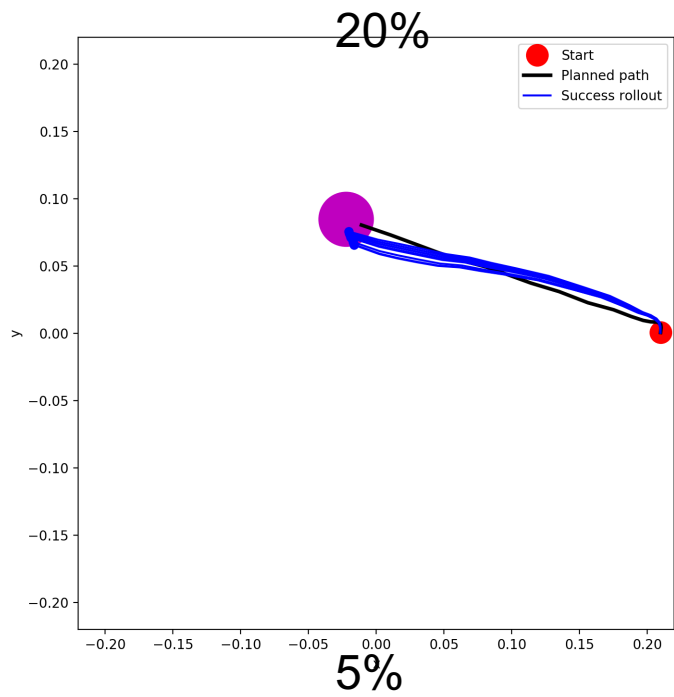
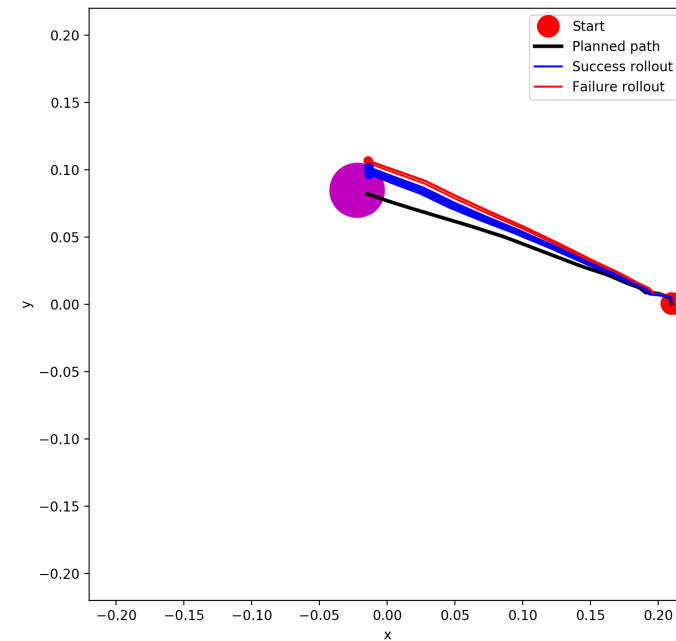
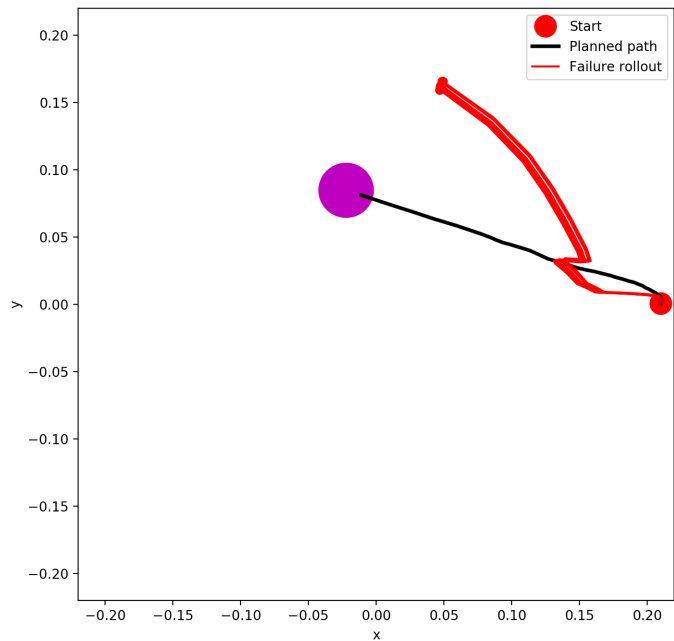




# Reacher Statistics (Goal Location 2)

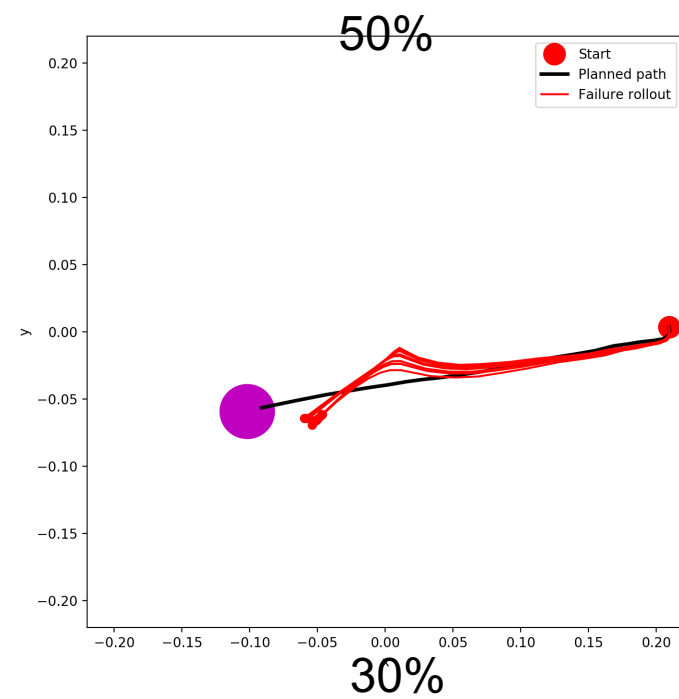
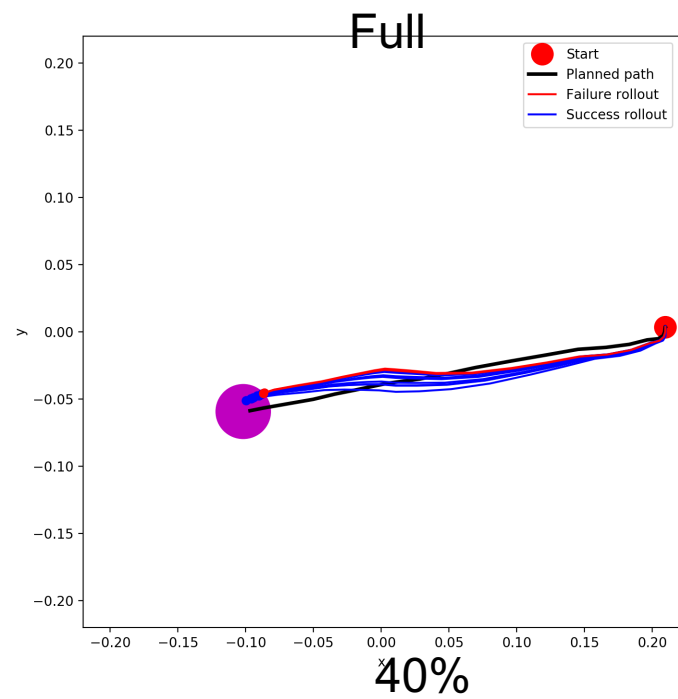
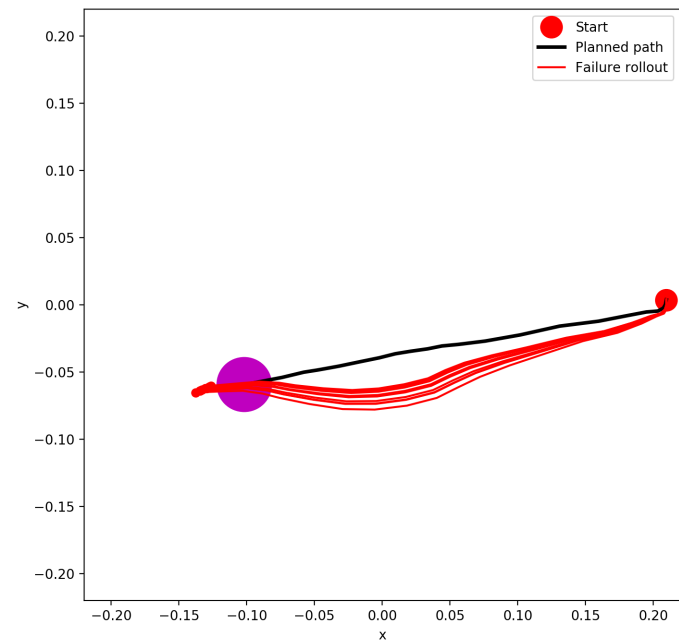
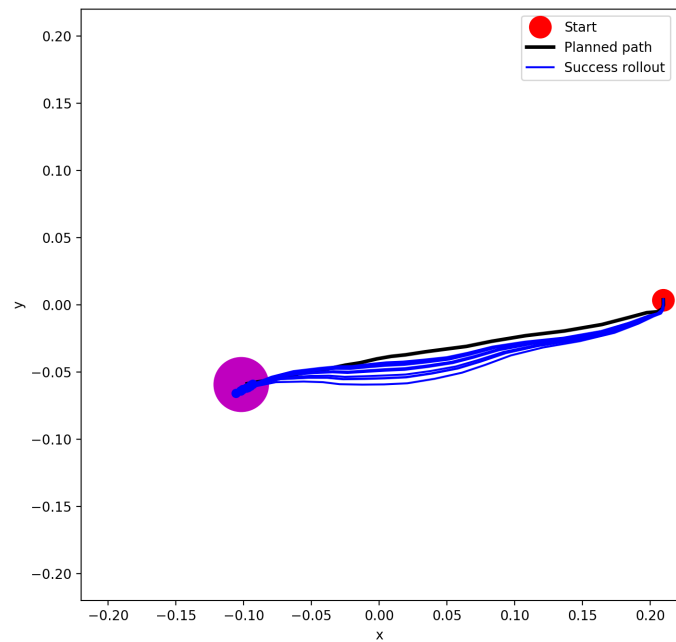
goal location (method) (data size)	goal reach rate	rollout path RMSE relative to plan path [mm]	path length [mm]		number of path steps	last distance to goal [mm]	
			plan	rollout		plan	rollout
2 (A*) (Full)	100%	0.00340±0.00065	0.24392	0.24707±0.00159	26	0.00859	0.00509±0.00105
2 (A*) (50%)	100%	0.00777±0.00047	0.24484	0.25917±0.00275	21	0.00579	0.00772±0.00148
2 (A*) (40%)	0%	0.01893±0.00135	0.24507	0.24537±0.00112	34	0.00649	0.04160±0.00260
2 (A*) (30%)	100%	0.00983±0.00144	0.23959	0.25906±0.00268	19	0.01195	0.00948±0.00322
2 (A*) (20%)	0%	0.04577±0.00152	0.23970	0.28048±0.00010	41	0.01160	0.10470±0.00201
2 (A*) (10%)	70%	0.00933±0.00196	0.24183	0.24906±0.00150	23	0.00808	0.01909±0.00280
2 (A*) (5%)	100%	0.01187±0.00129	0.23958	0.24499±0.00244	18	0.01206	0.01436±0.00341
2 (A*) (1%)	100%	0.00439±0.00081	0.23858	0.24125±0.00212	15	0.01366	0.01133±0.00118

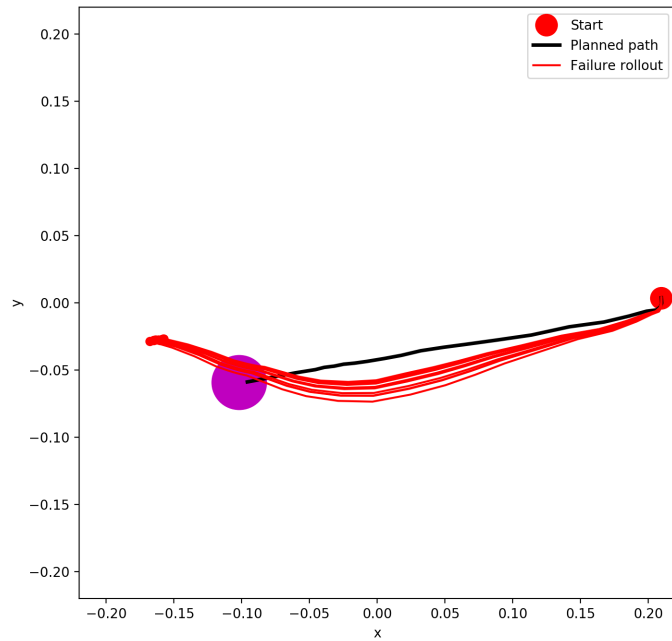




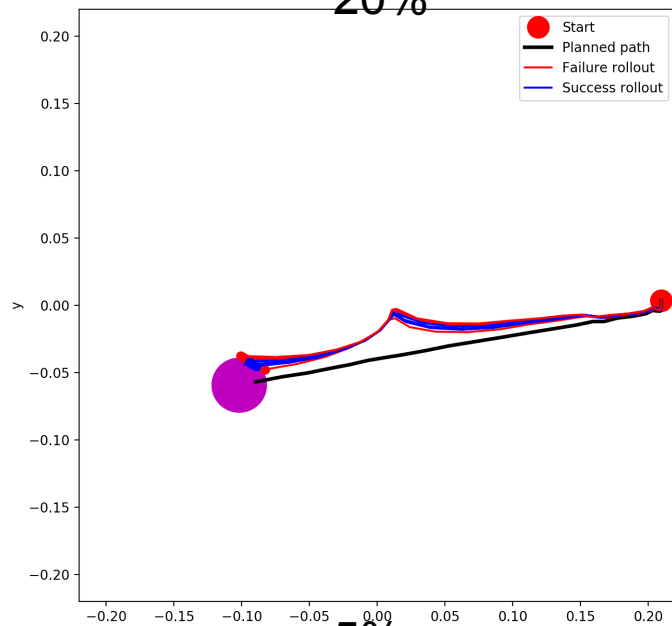
# Reacher Statistics (Goal Location 5)

goal location (method) (data size)	goal reach rate	rollout path RMSE relative to plan path [mm]	path length [mm]		number of path steps	last distance to goal [mm]	
			plan	rollout		plan	rollout
5 (A*) (Full)	100%	0.00871±0.00373	0.31887	0.32344±0.00551	23	0.00449	0.00598±0.00154
5 (A*) (50%)	0%	0.02734±0.00371	0.31571	0.35954±0.00590	23	0.00601	0.02933±0.00371
5 (A*) (40%)	80%	0.00818±0.00085	0.31776	0.31436±0.00518	23	0.00508	0.01544±0.00407
5 (A*) (30%)	0%	0.01648±0.00153	0.31226	0.29017±0.00490	24	0.01091	0.04908±0.00433
5 (A*) (20%)	0%	0.04170±0.00304	0.31758	0.39340±0.00630	26	0.00603	0.06782±0.00271
5 (A*) (10%)	50%	0.00743±0.00205	0.31047	0.30949±0.00593	26	0.01166	0.01924±0.00456
5 (A*) (5%)	50%	0.01594±0.00151	0.31194	0.32587±0.00516	25	0.01241	0.01986±0.00137
5 (A*) (1%)	0%	0.01770±0.00099	0.31736	0.34413±0.00406	23	0.00486	0.03746±0.00527

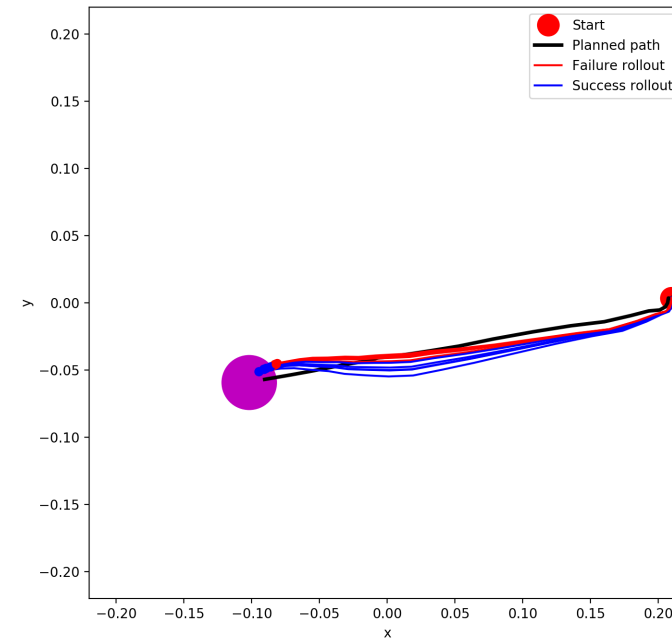




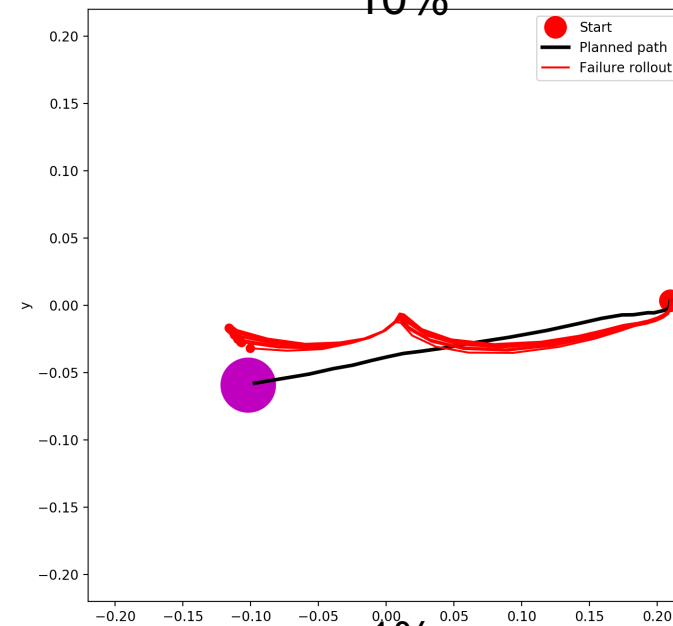
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# To Do List

- **Data efficiency of other goal locations for gazebo hand?**
- **Work on our new online method**

Mridul:

- Fix marker tracking error + Initial opening position
- Collect several episodes of data for testing my trained dynamics model

## *Real Hand*

- Redo calibration
- Test whether the trained real hand dynamics model also works with Mridul's new data or not
- Do rollouts for A\* and PPO policy on real hand
- **Data efficiency for rollout?**
  - New rollouts for A\* and PPO?
  - LQR

