Progress Report
2019-05-13

May 24, 2019

Parameters: `resample_interval =` 5, $N_{min} = 200$, $N_{max} = 500$.
In the tables below: `amcl`'s figures are in black; the scan-matcher's are in gray. Particles are selected as follows: either the top $100, 50, 10\%$ of particles is selected, or the heaviest, or those whose weight is larger than the mean weight of all particles.

1 `amcl−icp`

selection	loop	MAE-x [m]	MAE-y [m]	MAE-d [m]	MAE-θ [rad]	MAE	r_i	r_o
100 %	open	0.010803	0.010231	0.017096	0.0040694	0.0179824		
		0.0081967	0.0073292	0.012116	0.0037554	0.013517		
50 %	open	0.0099817	0.0096002	0.015927	0.0038163	0.016756		
		0.0081745	0.0073522	0.012135	0.0036716	0.013488		
10 %	open	0.011603	0.0094427	0.017139	0.0040415	0.018045		
		0.0079522	0.0072911	0.011926	0.0036991	0.013309		
top	open	0.01181	0.010808	0.017952	0.0056752	0.019515		
		0.0080277	0.0072761	0.011933	0.003729	0.013302		
$> \overline{W}$	open	0.010096	0.0098264	0.016262	0.0038285	0.017081		
		0.0082079	0.007338	0.012131	0.00368	0.013474		

Table 1: Open-loop mean absolute pose errors per selection percentage. Header: selection: type of selection of particles off `amcl` for outputting the final pose; `loop`: open; $x-$wise, $y-$wise, distance-wise, orientation-wise errors, and total errors. r_i is the rank of a configuration internal to this loop-closure regime. r_o is the rank of a configuration across all loop-closure regimes.

selection	loop	MAE-x [m]	MAE-y [m]	MAE-d [m]	MAE-θ [rad]	MAE	r_i	r_o
100 %	soft-1	0.007905	0.0072522	0.011817	0.0037748	0.013101		
		0.0080272	0.0071392	0.011805	0.0042586	0.013517		
50 %	soft-1	0.0078921	0.0072208	0.011769	0.0037277	0.013044		
		0.0080932	0.0070838	0.011807	0.0042712	0.013528		
10 %	soft-1	0.0079335	0.0072417	0.011849	0.0038619	0.013185		
		0.0079803	0.007102	0.01172	0.0043049	0.013456		
top	soft-1	0.0081511	0.0072985	0.01207	0.0042183	0.013606		
		0.0081199	0.0070991	0.011836	0.0042144	0.013517		
$> \overline{W}$	soft-1	0.0079498	0.0072665	0.011875	0.0038296	0.013188		
		0.0080495	0.0071206	0.011809	0.0041989	0.013472		

Table 2: Soft-closed mean absolute pose errors per selection percentage. Header: % particles selected for averaging the final pose; `loop`: soft-closed; $x-$wise, $y-$wise, distance-wise, orientation-wise, and total errors. r_i is the rank of a configuration internal to this loop-closure regime. r_o is the rank of a configuration across all loop-closure regimes.

selection	loop	MAE-x [m]	MAE-y [m]	MAE-d [m]	MAE-θ [rad]	MAE	r_i	r_o
100 %	soft-50	0.0078379	0.0072797	0.01182	0.0039201	0.013338		
		0.0079403	0.0071694	0.011769	0.0043449	0.013543		
50 %	soft-50	0.0078833	0.0071938	0.011783	0.0039812	0.013358		
		0.0079931	0.0070734	0.011712	0.0044762	0.013586		
10 %	soft-50	0.007684	0.0070832	0.011477	0.0033839	0.012685		
		0.0079552	0.0071379	0.011748	0.0043497	0.013535		
top	soft-50	0.0074128	0.0069519	0.011088	0.0032546	0.012174		
		0.0080416	0.0070744	0.011756	0.0043869	0.013563		
$> \overline{W}$	soft-50	0.0078438	0.0071938	0.011742	0.0040213	0.013337		
		0.0080099	0.0070758	0.0117489	0.0045428	0.013663		

Table 3: Soft-closed mean absolute pose errors per selection percentage. Header: % particles selected for averaging the final pose; `loop`: soft-closed; $x-$wise, $y-$wise, distance-wise, orientation-wise, and total errors. r_i is the rank of a configuration internal to this loop-closure regime. r_o is the rank of a configuration across all loop-closure regimes.

selection	loop	MAE-x [m]	MAE-y [m]	MAE-d [m]	MAE-θ [rad]	MAE	r_i	r_o
100 %	hard	0.0075889	0.0074509	0.011419	0.0050763	0.01348		
		0.0078075	0.007808	0.012045	0.0042282	0.013691		
50 %	hard	0.007629	0.0074772	0.011475	0.0039996	0.0129		
		0.0078025	0.0078164	0.012048	0.0042842	0.013734		
10 %	hard	0.0073637	0.0074838	0.011321	0.0031504	0.0123017		
		0.0078071	0.0078654	0.012099	0.0041696	0.013708		
top	hard	0.00717796	0.0074242	0.011202	0.002891	0.012034		
		0.0077837	0.0077645	0.011998	0.0041828	0.013622		
$> \overline{W}$	hard	0.0077409	0.0074716	0.011551	0.0046831	0.013322		
		0.0078029	0.0078226	0.012058	0.0041962	0.01369		

Table 4: Hard-closed-loop mean absolute pose errors per selection percentage. Header: % particles selected for averaging the final pose; `loop`: hard-closed; $x-$wise, $y-$wise, distance-wise, orientation-wise errors, and total error. r_i is the rank of a configuration internal to this loop-closure regime. r_o is the rank of a configuration across all loop-closure regimes.

2 `amcl-icp-dft`

selection	loop	MAE-x [m]	MAE-y [m]	MAE-d [m]	MAE-θ [rad]	MAE	r_i	r_o
100 %	open	0.0096321	0.010278	0.016135	0.0040343	0.01704		
		0.0080118	0.0071215	0.011884	0.0036416	0.013225		
50 %	open	0.0087241	0.0093908	0.01472	0.0036341	0.015517		
		0.0080152	0.0071136	0.011887	0.0036049	0.0132		
10 %	open	0.011	0.0095142	0.016653	0.0041056	0.017579		
		0.0079183	0.007014	0.011725	0.0036524	0.013076		
top	open	0.011491	0.01053	0.017437	0.0056225	0.01901		
		0.0078809	0.0070287	0.011697	0.0037298	0.013079		
$> \overline{W}$	open	0.0092981	0.010004	0.015634	0.00382	0.016459		
		0.008017	0.0070626	0.011829	0.0036234	0.013153		

Table 5: Open-loop mean absolute pose errors per selection percentage. Header: selection: type of selection of particles off `amcl` for outputting the final pose; `loop`: open; $x-$wise, $y-$wise, distance-wise, orientation-wise errors, and total errors. r_i is the rank of a configuration internal to this loop-closure regime. r_o is the rank of a configuration across all loop-closure regimes.

selection	loop	MAE-x [m]	MAE-y [m]	MAE-d [m]	MAE-θ [rad]	MAE	r_i	r_o
100 %	soft-1	0.0081815	0.007195	0.012119	0.0033952	0.013163		
		0.0078706	0.0069582	0.011592	0.0039716	0.01312		
50 %	soft-1	0.0080638	0.007126	0.011953	0.003501	0.013077		
		0.0079359	0.0069343	0.011627	0.0041265	0.013258		
10 %	soft-1	0.0081969	0.0071684	0.012123	0.0034981	0.013228		
		0.0079255	0.0069845	0.011673	0.0039399	0.013186		
top	soft-1	0.0080969	0.0071319	0.011966	0.0040708	0.0134156		
		0.0078646	0.0069332	0.011577	0.0040413	0.01316		
$> \overline{W}$	soft-1	0.0082008	0.0071381	0.012086	0.0036731	0.013298		
		0.0079611	0.0069353	0.01165	0.0041211	0.013281		

Table 6: Soft-closed mean absolute pose errors per selection percentage. Header: % particles selected for averaging the final pose; `loop`: soft-closed; $x-$wise, $y-$wise, distance-wise, orientation-wise, and total errors. r_i is the rank of a configuration internal to this loop-closure regime. r_o is the rank of a configuration across all loop-closure regimes.

selection	loop	MAE-x [m]	MAE-y [m]	MAE-d [m]	MAE-θ [rad]	MAE	r_i	r_o
100 %	soft-50	0.0078399	0.0070543	0.011702	0.0037685	0.013129		
		0.0078301	0.0069371	0.011545	0.00421	0.013238		
50 %	soft-50	0.0078101	0.006994	0.011624	0.0038108	0.013086		
		0.0078187	0.0069051	0.011509	0.0042582	0.013234		
10 %	soft-50	0.0076206	0.006849	0.011311	0.0034307	0.012521		
		0.0078827	0.006989	0.011627	0.0041357	0.013275		
top	soft-50	0.0073207	0.0067625	0.010946	0.0031944	0.011971		
		0.0078201	0.0068962	0.011509	0.0042492	0.013231		
$> \overline{W}$	soft-50	0.0078232	0.0070273	0.011671	0.0037715	0.013102		
		0.0078289	0.0069171	0.01152	0.004273	0.01325		

Table 7: Soft-closed mean absolute pose errors per selection percentage. Header: % particles selected for averaging the final pose; `loop`: soft-closed; $x-$wise, $y-$wise, distance-wise, orientation-wise, and total errors. r_i is the rank of a configuration internal to this loop-closure regime. r_o is the rank of a configuration across all loop-closure regimes.

selection	loop	MAE-x [m]	MAE-y [m]	MAE-d [m]	MAE-θ [rad]	MAE	r_i	r_o
100 %	hard	0.0074517	0.0071074	0.011093	0.0056152	0.013533		
		0.0077245	0.0076191	0.011903	0.0041661	0.013527		
50 %	hard	0.0074587	0.0071535	0.011112	0.0041804	0.012665		
		0.0077074	0.0076137	0.011876	0.0040936	0.013448		
10 %	hard	0.0072978	0.0071982	0.011059	0.0033318	0.012143		
		0.0076677	0.007596	0.01184	0.0041081	0.013428		
top	hard	0.007142	0.007338	0.011100	0.002941	0.011955		
		0.007676	0.007549	0.011805	0.004147	0.013413		
$> \overline{W}$	hard	0.0075614	0.0070672	0.011158	0.0051469	0.013282		
		0.0077382	0.0075824	0.011881	0.0042171	0.013531		

Table 8: Hard-closed-loop mean absolute pose errors per selection percentage. Header: % particles selected for averaging the final pose; `loop`: hard-closed; $x-$wise, $y-$wise, distance-wise, orientation-wise errors, and total error. r_i is the rank of a configuration internal to this loop-closure regime. r_o is the rank of a configuration across all loop-closure regimes.