Operator-Counting Goal Recognition - Results (Noisy and Missing)

?

Partial and Full Observability

				δ_{HC}			δ_{HCU}			RG 2009			POM 2017 h_{gc}			POM 2017 h_{uniq}		
#	$\lvert\mathcal{G}\rvert$	% Obs	$\lvert\mathcal{O}\rvert$	Time	Acc %	S in $\mathcal{G}$	Time	Acc %	S in $\mathcal{G}$	Time	Acc %	S in $\mathcal{G}$	Time	Acc %	S in $\mathcal{G}$	Time	Acc %	S in $\mathcal{G}$
BLOCKS (1076)	20.3	10	1.8	11.575	95.5%	7.81	11.574	95.9%	8.7	1.222	86.8%	7.84	0.144	39.9%	1.05	0.131	31.7%	1.04
		30	4.9	11.570	89.4%	2.79	11.567	94.3%	5.12	1.639	87.2%	3.57	0.156	50.6%	1.09	0.144	51.4%	1.06
		50	7.6	11.581	92.7%	1.78	11.587	93.9%	3.24	2.402	97.9%	2.63	0.179	65.0%	1.09	0.168	60.1%	1.08
		70	11.1	11.594	98.8%	1.41	11.595	98.8%	1.8	3.785	97.5%	1.83	0.192	84.8%	1.12	0.184	79.0%	1.14
		100	14.5	11.904	100.0%	1.21	11.937	100.0%	1.21	6.791	100.0%	1.46	0.246	100.0%	1.36	0.239	100.0%	1.09
DEPOTS (364)	8.5	10	3.1	8.299	61.9%	2.15	8.305	71.4%	3.51	1.496	77.4%	3.99	0.369	35.7%	1.18	0.393	32.1%	1.1
		30	8.6	8.292	71.4%	1.4	8.298	88.1%	4.17	2.309	77.4%	2.39	0.357	58.3%	1.06	0.393	47.6%	1.07
		50	14.1	8.282	92.9%	1.38	8.280	98.8%	3.65	3.411	84.5%	1.92	0.369	76.2%	1.06	0.405	71.4%	1.02
		70	19.7	8.282	97.6%	1.06	8.279	98.8%	1.75	5.271	91.7%	1.68	0.393	89.3%	1.01	0.444	84.5%	1.01
		100	24.4	8.296	100.0%	1.0	8.296	100.0%	1.0	7.117	92.9%	1.46	0.464	100.0%	1.04	0.502	100.0%	1.04
DRIVERLOG (364)	10.5	10	2.6	5.159	77.4%	2.61	5.168	78.6%	3.17	1.169	96.4%	4.71	0.333	41.7%	1.04	0.321	35.7%	1.11
		30	6.9	5.149	83.3%	1.69	5.163	91.7%	2.76	1.411	92.9%	3.35	0.311	54.8%	1.13	0.310	47.6%	1.1
		50	11.1	5.167	92.9%	1.23	5.146	97.6%	2.0	1.694	94.0%	2.88	0.321	72.6%	1.17	0.310	64.3%	1.14
		70	15.6	5.148	95.2%	1.14	5.146	95.2%	1.5	1.973	89.3%	2.46	0.333	90.5%	1.14	0.321	90.5%	1.17
		100	21.7	5.166	100.0%	1.04	5.157	100.0%	1.04	2.821	89.3%	2.14	0.321	100.0%	1.21	0.321	100.0%	1.18
DWR (364)	7.3	10	5.7	5.759	54.8%	2.21	5.745	95.2%	5.45	1.767	83.3%	4.21	0.452	36.9%	1.1	0.512	33.3%	1.06
		30	16.0	5.745	83.3%	1.58	5.753	100.0%	4.92	2.723	81.0%	3.35	0.452	60.7%	1.04	0.504	51.2%	1.06
		50	26.2	5.742	90.5%	1.21	5.734	100.0%	3.98	4.822	72.6%	2.27	0.488	66.7%	1.0	0.548	61.9%	1.01
		70	36.8	5.752	97.6%	1.07	5.735	100.0%	2.26	10.914	70.2%	2.05	0.536	89.3%	1.0	0.607	78.6%	1.05
		100	51.9	5.763	100.0%	1.0	5.75	100.0%	1.0	25.092	67.9%	1.68	0.643	100.0%	1.0	0.751	96.4%	1.04
IPC-GRID (673)	9.0	10	2.9	6.216	92.8%	1.92	6.209	94.8%	2.32	1.091	96.1%	2.46	0.248	66.7%	2.58	0.242	62.7%	2.58
		30	7.8	6.051	95.4%	1.29	6.044	98.0%	1.48	1.476	97.4%	1.42	0.242	81.7%	1.65	0.242	83.7%	1.66
		50	12.7	6.123	98.7%	1.11	6.122	100.0%	1.25	1.905	100.0%	1.16	0.261	90.8%	1.18	0.248	90.8%	1.18
		70	17.9	6.251	99.4%	1.1	6.259	100.0%	1.19	2.552	100.0%	1.05	0.268	97.4%	1.07	0.268	97.4%	1.07
		100	24.8	5.825	100.0%	1.03	5.826	100.0%	1.03	4.057	100.0%	1.0	0.262	100.0%	1.0	0.262	100.0%	1.0
FERRY (364)	7.5	10	2.9	4.201	100.0%	3.17	4.201	100.0%	3.2	0.491	98.8%	3.37	0.071	58.3%	1.26	0.071	58.3%	1.18
		30	7.6	4.072	100.0%	1.56	4.075	100.0%	1.76	0.677	100.0%	1.76	0.061	85.7%	1.12	0.060	83.3%	1.06
		50	12.3	4.141	100.0%	1.29	4.141	100.0%	1.44	0.795	100.0%	1.42	0.062	95.2%	1.07	0.060	91.7%	1.01
		70	17.3	4.199	100.0%	1.1	4.197	100.0%	1.12	1.253	98.8%	1.14	0.071	100.0%	1.01	0.071	100.0%	1.0
		100	24.2	4.196	100.0%	1.07	4.204	100.0%	1.07	1.631	100.0%	1.07	0.071	100.0%	1.0	0.071	100.0%	1.0
LOGISTICS (673)	10.5	10	2.9	6.79	100.0%	2.5	6.789	100.0%	2.8	1.201	99.3%	2.98	0.641	55.6%	1.73	0.641	49.0%	1.24
		30	8.2	6.953	98.0%	1.3	6.944	98.0%	1.76	1.799	98.7%	1.39	0.621	80.4%	1.21	0.634	76.5%	1.12
		50	13.4	6.944	98.7%	1.13	6.959	98.7%	1.37	2.509	98.7%	1.29	0.641	90.2%	1.1	0.647	86.3%	1.05
		70	18.9	6.938	100.0%	1.08	6.951	100.0%	1.15	3.461	100.0%	1.13	0.667	96.7%	1.06	0.661	96.7%	1.02
		100	26.5	6.63	100.0%	1.0	6.633	100.0%	1.0	4.832	100.0%	1.0	0.607	100.0%	1.0	0.607	100.0%	1.0
MICONIC (364)	6.0	10	3.9	4.905	100.0%	2.12	4.886	100.0%	2.29	0.813	100.0%	3.26	0.464	67.9%	1.33	0.352	54.8%	1.26
		30	11.1	4.897	100.0%	1.19	4.895	100.0%	1.46	1.191	100.0%	1.58	0.452	96.4%	1.11	0.364	90.5%	1.08
		50	18.1	4.901	100.0%	1.1	4.891	100.0%	1.32	1.722	100.0%	1.29	0.452	96.4%	1.01	0.352	96.4%	1.0
		70	25.3	4.892	100.0%	1.01	4.891	100.0%	1.02	2.591	100.0%	1.04	0.452	100.0%	1.01	0.376	100.0%	1.01
		100	35.6	4.894	100.0%	1.0	4.894	100.0%	1.0	5.107	100.0%	1.0	0.464	100.0%	1.0	0.364	100.0%	1.0
ROVERS (364)	6.0	10	3.0	4.863	98.8%	2.71	4.858	100.0%	2.94	0.745	98.8%	2.86	0.348	64.3%	1.73	0.371	51.2%	1.11
		30	7.9	4.881	85.7%	1.17	4.871	91.7%	1.83	1.031	100.0%	1.67	0.348	83.3%	1.24	0.348	69.0%	1.07
		50	12.7	4.87	98.8%	1.14	4.856	98.8%	1.44	1.345	100.0%	1.3	0.336	92.9%	1.08	0.348	85.7%	1.01
		70	17.9	4.858	98.8%	1.01	4.838	98.8%	1.06	1.177	100.0%	1.07	0.348	98.8%	1.01	0.362	91.7%	1.0
		100	24.9	4.823	100.0%	1.0	4.884	100.0%	1.0	2.298	100.0%	1.07	0.371	100.0%	1.0	0.571	100.0%	1.0
SATELLITE (364)	6.5	10	2.1	5.196	91.7%	2.73	5.204	92.9%	2.92	1.076	97.6%	3.42	0.451	57.1%	1.56	0.450	47.6%	1.21
		30	5.4	5.178	92.9%	1.76	5.201	96.4%	2.31	1.183	97.6%	2.4	0.451	76.2%	1.31	0.414	69.0%	1.14
		50	8.7	5.197	96.4%	1.32	5.194	98.8%	1.77	1.328	97.6%	1.69	0.426	85.7%	1.1	0.414	81.0%	1.11
		70	12.2	5.191	97.6%	1.11	5.193	97.6%	1.21	1.841	96.4%	1.52	0.402	97.6%	1.02	0.414	94.0%	1.04
		100	16.8	5.212	100.0%	1.07	5.205	100.0%	1.07	2.045	96.4%	1.32	0.414	100.0%	1.07	0.414	100.0%	1.07
SOKOBAN (364)	7.3	10	3.1	7.827	72.6%	1.61	7.849	78.6%	2.39	3.153	69.0%	4.02	0.607	53.6%	2.06	0.607	51.2%	1.86
		30	8.7	7.744	89.3%	1.11	7.742	95.2%	1.75	4.622	89.3%	4.17	0.595	57.1%	1.37	0.607	56.0%	1.21
		50	14.1	7.701	95.2%	1.08	7.709	100.0%	1.46	7.441	89.3%	4.11	0.595	71.4%	1.32	0.607	69.0%	1.2
		70	19.8	7.69	97.6%	1.04	7.677	98.8%	1.15	9.877	89.3%	4.18	0.608	83.3%	1.05	0.607	86.9%	1.08
		100	35.5	7.671	100.0%	1.0	7.658	100.0%	1.0	12.996	89.3%	4.54	0.607	100.0%	1.0	0.643	100.0%	1.0
ZENO (364)	7.5	10	2.6	6.843	86.9%	2.71	6.871	88.1%	3.12	1.814	96.4%	3.4	0.567	39.3%	1.11	0.555	36.9%	1.05
		30	6.7	6.838	90.5%	1.61	6.854	96.4%	2.56	2.539	88.1%	2.12	0.555	70.2%	1.15	0.531	60.7%	1.02
		50	10.8	6.845	95.2%	1.15	6.851	96.4%	1.83	3.079	92.9%	1.42	0.543	78.6%	1.07	0.555	76.2%	1.0
		70	15.2	6.855	100.0%	1.0	6.851	100.0%	1.04	3.907	96.4%	1.13	0.567	97.6%	1.05	0.555	90.5%	1.0
		100	21.1	6.852	100.0%	1.0	6.842	100.0%	1.0	4.866	100.0%	1.07	0.543	100.0%	1.0	0.543	100.0%	1.0
Average				6.456	94.11%	1.55	6.457	96.94%	2.14	3.322	93.38%	2.30	0.397	79.66%	1.18	0.400	75.87%	1.12

Noisy, Partial, and Full Observability

				δ_{HC}			δ_{HCU}			RG 2009			POM 2017 h_{gc}			POM 2017 h_{uniq}		
#	$\lvert\mathcal{G}\rvert$	% Obs	$\lvert\mathcal{O}\rvert$	Time	Acc %	S in $\mathcal{G}$	Time	Acc %	S in $\mathcal{G}$	Time	Acc %	S in $\mathcal{G}$	Time	Acc %	S in $\mathcal{G}$	Time	Acc %	S in $\mathcal{G}$
BLOCKS (144)	20.3	25	2.4	16.033	58.3%	6.22	16.019	75.0%	10.39	1.045	38.9%	5.39	0.083	2.8%	1.22	0.083	8.3%	1.0
		50	4.4	12.626	52.8%	3.31	12.675	88.9%	12.44	1.122	52.8%	4.61	0.083	25.0%	1.19	0.083	13.9%	1.08
		75	6.8	11.282	80.6%	2.11	11.235	91.7%	7.36	1.405	75.0%	2.72	0.056	47.2%	1.19	0.056	38.9%	1.25
		100	8.8	10.576	88.9%	1.92	10.629	97.2%	2.86	1.652	86.1%	2.03	0.083	77.8%	1.36	0.056	75.0%	1.33
DEPOTS (144)	9.3	25	4.4	11.495	52.8%	2.19	11.445	63.9%	4.47	0.284	5.6%	9.17	0.528	38.9%	1.64	0.528	27.8%	1.22
		50	8.4	10.299	61.1%	1.67	10.263	83.3%	4.14	0.189	0.0%	9.33	0.472	52.8%	1.22	0.472	41.7%	1.19
		75	12.7	8.671	88.9%	1.19	8.674	94.4%	2.14	0.361	11.1%	8.28	0.472	80.6%	1.11	0.500	75.0%	1.06
		100	16.2	8.098	94.4%	1.19	8.075	91.7%	1.22	0.292	5.6%	8.83	0.472	88.9%	1.11	0.472	86.1%	1.11
DRIVERLOG (144)	6.6	25	3.5	5.383	55.6%	2.61	5.362	83.3%	4.69	0.234	44.4%	5.89	0.111	36.1%	1.33	0.111	25.0%	1.08
		50	6.7	4.982	77.8%	1.72	4.971	91.7%	3.47	0.282	38.9%	4.72	0.083	58.3%	1.28	0.083	52.8%	1.11
		75	10.0	4.825	86.1%	1.25	4.855	94.4%	2.31	0.239	30.6%	5.47	0.083	61.1%	1.33	0.111	52.8%	1.14
		100	12.8	4.511	97.2%	1.31	4.511	97.2%	1.64	0.358	44.4%	4.42	0.084	94.4%	1.47	0.083	97.2%	1.42
DWR (144)	7.0	25	9.2	7.546	72.2%	2.0	7.614	97.2%	5.11	0.808	41.7%	5.67	0.444	44.4%	1.14	0.501	33.3%	1.0
		50	17.8	7.108	80.6%	1.67	7.153	94.4%	4.47	1.569	22.2%	5.39	0.417	63.9%	1.08	0.444	50.0%	1.06
		75	26.6	6.509	91.7%	1.22	6.482	94.4%	1.78	2.793	19.4%	5.5	0.417	94.4%	1.06	0.472	69.4%	1.08
		100	34.9	5.803	100.0%	1.08	5.768	97.2%	1.06	7.392	30.6%	4.42	0.444	94.4%	1.0	0.472	94.4%	1.03
IPC-GRID (300)	8.3	25	4.0	7.871	81.1%	1.67	7.889	85.6%	2.61	0.265	12.2%	7.56	0.244	58.9%	1.78	0.233	53.3%	1.72
		50	7.7	6.031	94.4%	1.14	6.011	94.4%	1.71	0.240	4.4%	8.07	0.222	85.6%	1.33	0.211	83.3%	1.32
		75	11.5	5.481	98.9%	1.1	5.497	97.8%	1.13	0.223	6.7%	7.89	0.213	94.4%	1.09	0.211	94.4%	1.09
		100	16.9	5.011	100.0%	1.0	4.988	90.0%	0.9	0.266	10.0%	7.77	0.202	100.0%	1.0	0.200	100.0%	1.0
FERRY (0)	7.0	25	5.8	4.745	80.6%	2.78	4.736	86.1%	5.11	0.256	75.0%	2.92	0.028	47.2%	1.28	0.028	27.8%	1.08
		50	11.2	4.402	97.2%	1.72	4.365	97.2%	3.83	0.375	94.4%	1.94	0.028	88.9%	1.31	0.028	77.8%	1.06
		75	16.6	4.236	94.4%	1.56	4.223	97.2%	2.42	0.585	88.9%	1.53	0.030	97.2%	1.17	0.028	83.3%	1.08
		100	21.9	4.187	97.2%	1.17	4.183	97.2%	1.17	0.906	97.2%	1.25	0.029	100.0%	1.08	0.028	97.2%	1.06
LOGISTICS (144)	10.0	25	4.8	7.461	91.7%	2.11	7.446	97.2%	3.42	0.203	5.6%	9.42	0.223	61.1%	1.56	0.222	38.9%	1.08
		50	9.4	6.875	97.2%	1.11	6.848	97.2%	1.36	0.214	5.6%	9.33	0.194	83.3%	1.17	0.167	75.0%	1.06
		75	14.1	6.253	100.0%	1.03	6.234	100.0%	1.06	0.259	13.9%	8.78	0.194	97.2%	1.0	0.167	100.0%	1.03
		100	18.1	5.436	100.0%	1.08	5.438	100.0%	1.08	0.321	13.9%	8.78	0.195	100.0%	1.06	0.194	100.0%	1.03
MICONIC (144)	6.0	25	4.4	4.892	52.8%	1.97	4.908	83.3%	4.17	0.318	88.9%	2.89	0.111	50.0%	1.39	0.111	33.3%	1.17
		50	8.4	4.533	80.6%	1.17	4.566	97.2%	2.17	0.387	100.0%	1.75	0.083	83.3%	1.11	0.083	80.6%	1.11
		75	12.6	4.387	91.7%	1.06	4.379	100.0%	1.31	0.483	100.0%	1.19	0.083	97.2%	1.03	0.083	88.9%	1.03
		100	16.3	4.294	100.0%	1.03	4.311	100.0%	1.08	0.628	100.0%	1.0	0.056	100.0%	1.0	0.056	100.0%	1.0
ROVERS (144)	6.0	25	3.1	5.346	72.2%	2.22	5.359	75.0%	2.78	0.264	33.3%	4.78	0.083	52.8%	1.14	0.083	50.0%	1.14
		50	5.7	4.973	80.6%	1.61	4.941	88.9%	2.92	0.296	50.0%	3.81	0.056	69.4%	1.31	0.056	58.3%	1.08
		75	8.4	4.889	91.7%	1.14	4.905	100.0%	1.47	0.301	44.4%	3.92	0.083	86.1%	1.14	0.056	75.0%	1.08
		100	10.8	4.513	100.0%	1.03	4.531	100.0%	1.03	0.305	38.9%	4.06	0.083	97.2%	1.11	0.056	86.1%	1.03
SATELLITE (144)	6.0	25	3.3	4.511	75.0%	3.31	4.444	88.9%	4.28	0.224	58.3%	4.53	0.056	52.8%	2.42	0.056	30.6%	1.33
		50	5.7	4.056	72.2%	2.44	4.091	83.3%	3.92	0.255	72.2%	3.58	0.028	72.2%	2.08	0.028	44.4%	1.31
		75	8.4	3.915	83.3%	1.44	3.966	88.9%	2.83	0.292	77.8%	2.75	0.028	80.6%	1.28	0.028	69.4%	1.08
		100	10.7	3.929	94.4%	1.47	3.935	94.4%	1.86	0.298	72.2%	3.0	0.056	94.4%	1.31	0.028	91.7%	1.19
SOKOBAN (0)	8.6	25	5.3	13.104	36.1%	1.64	13.101	72.2%	4.69	1.953	25.0%	7.28	0.751	41.7%	1.75	0.750	38.9%	1.56
		50	10.3	11.319	50.0%	1.17	11.323	58.3%	1.94	2.086	19.4%	6.67	0.667	66.7%	1.44	0.694	58.3%	1.08
		75	15.6	9.527	36.1%	1.0	9.461	36.1%	0.56	2.121	19.4%	7.69	0.694	80.6%	1.28	0.667	72.2%	1.03
		100	20.1	8.946	33.3%	1.11	9.029	36.1%	0.5	5.878	33.3%	6.47	0.694	94.4%	1.22	0.694	86.1%	1.06
ZENO (144)	6.6	25	3.0	8.209	44.4%	2.72	8.271	80.6%	5.25	0.946	72.2%	3.92	0.417	55.6%	1.92	0.417	33.3%	1.03
		50	5.8	7.712	91.7%	1.61	7.653	97.2%	4.03	1.025	88.9%	1.78	0.361	77.8%	1.67	0.361	61.1%	1.08
		75	8.8	6.785	91.7%	1.08	6.766	100.0%	2.44	1.167	100.0%	1.22	0.361	88.9%	1.25	0.361	77.8%	1.0
		100	11.3	6.177	97.2%	1.0	6.141	100.0%	1.42	1.289	97.2%	1.08	0.361	97.2%	1.08	0.333	97.2%	1.03
Average				6.870	80.14%	1.69	6.868	88.68%	3.04	0.929	47.22%	5.01	0.234	73.21%	1.30	0.234	64.71%	1.13

Table 1: Experimental results comparing our lp-based heuristics against the other approaches under noisy, partial, and full observable plans.