

Semi-Infinite Programming with Complementarity Constraints for Pose Optimization with Pervasive Contact

Mengchao Zhang and Kris Hauser

The purpose of this document is to correct a minor error in the published conference paper “Semi-Infinite Programming with Complementarity Constraints for Pose Optimization with Pervasive Contact,” which appeared in the proceedings of the 2021 IEEE International Conference on Robotics and Automation (ICRA).

The paper’s experiments used an oracle that mistakenly included a slight variation of the procedure described in Sec. IV.D. This variation was not described in the text and was intended to be removed in final testing. The variation sampled two extra index points from the 50 closest points around every point selected by the original oracle. This caused a result that for each link geometry, at most 3 (MVO) or 6 (LSO) points were added to the index set in each iteration, which explains why the average number of index points and number of active index points in Table I of the original paper were higher than expected.

The results from the original version of the oracle are shown below, indicating a minor effect on performance. The results in Table II and Figure 4 of the original paper are similar between the variants, suggesting that the variant has only a minor effect on performance.

Test Case	# in PC	DoF	Initial	Iter	Time (s)	Comp Gap (N · m)	Bal Res	Pen (m)	# Contact	Ave Index	Ave Active Index
Gripper, Wine Glass	436,804	18	Close	13	33.1	7.1e-3	3.5e-13	3.7e-4	10	27.0	4.8
			Far	10	30.6	4.8e-3	3.7e-13	8.5e-4	6	23.8	1.4
Gripper, Bowl	674,594	18	Close	11	36.2	1.2e-3	2.1e-14	2.6e-4	21	27.8	7.8
			Far	10	27.3	9.9e-6	1.2e-14	8.6e-4	10	24.7	3.2
Humanoid, Sphere	28,362	63	Close	13	103.9	2.0e-3	2.8e-13	5.4e-4	8	61.7	3.8
			Far	23	185.3	5.0e-3	1.7e-6	6.0e-5	5	59.7	1.4

TABLE I: Corrections to Table I of the original paper