HIGHER DIMENSIONAL MOTION PLANNERS FOR $F(\mathbb{R}^n, k)$

AYŞE BORAT

Abstract

Two of the main problems in Topological Robotics are to compute the topological complexity and to give a motion planner of a given space. The importance of motion planners follow not only from the fact that they give explicit motion planning algorithms but also from the fact that such algorithms can be used to compute topological complexity.

In this talk, we will introduce m-dimensional motion planners for the spaces $F(\mathbb{R}^n, k) = \{(x_1, x_2, \cdots, x_k) \in \mathbb{R}^n | x_i \neq x_j\}$. This construction of the m-dimensional motion planners tells that that $\mathrm{TC}_m(F(\mathbb{R}^n, k)) \leq m(k-1)+1$. On the other hand, regarding Theorem 1.3 in [1], this result is optimal when n is odd, but it is 1 unit away from being optimal when n is even.

References

[1] J. Gonzalez, M. Grant, Sequential motion planning of non-colliding particles in Euclidean spaces (accepted for publication in the Proceedings of the American Mathematical Society).

[2] H. Mas-Ku, E. Torres-Giese, Motion planning algorithm for configuration spaces, Bol. Soc. Mat. Mex., DOI: DOI 10.1007/s40590-014-0046-2.