

Short visit grant 6465

Scientific report

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I visited Portugal during May 25 - 31, 2014.

The purpose of the visit was advancement of a joint research project with Professor Lucile Vandembroucq from the University of Braga. Our collaboration started during the visit of Professor Lucile Vandembroucq to Warwick, UK in December 2013.

Our goal was to develop new techniques allowing computation of the topological complexity using advanced cohomological tools. The topological notion of topological complexity reflects the structure of motion planning algorithms in robotics. The technique of using the multiplicative structure in cohomology is well known and our goal was to improve the known estimates by incorporating information related to cohomological operations.

During my short visit we tried a new approach based on a new interesting variation of the notion of weight of a cohomology class with respect to a fibration. Besides, we discussed and made an essential progress in another currently open problem of topological robotics - computing the topological complexity of aspherical spaces.

The results which were obtained during my visit as well as new ideas which were produced will now be evaluated and further developed by us working independently and communicating via email. We hope that we will be able to make substantial progress and will produce a joint publication soon.