Bernoullis Tafelrunde

Graduate Student Seminar

Thursday, 29 October, 12:15-13:00
Seminarraum 00.003, Spiegelgasse 1

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Purcell swimmer and sub-Riemannian geometry

Abstract

In this talk we make a geometry analysis of the optimal strokes associated to the swimming problem at low Reynolds number, minimizing the mechanical energy, using the Purcell Three-link swimmer. We will introduce some basic facts about sub-Riemannian geometry especially the first order theory to discuss the nilpotent approximation associated to strokes with small amplitudes. More global results are presented combining geometric and numerical analysis to understand the role of abnormal curves and to analyze the second-order optimality conditions related to global optimality.