Abstract - Shortest-path recovery from signature with an optimal control approach

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In this talk, we consider the signature-to-path reconstruction problem from the control theoretic perspective. Namely, we design an optimal control problem whose solution leads to the minimal-length path that generates a given signature. In order to do that, we minimize a cost functional consisting of two competing terms, i.e., a weighted final-time cost combined with the L^2-norm squared of the controls. Moreover, we can show that, by taking the limit to infinity of the parameter that tunes the final-time cost, the problem Γ-converges to the problem of finding a sub-Riemannian geodesic connecting two signatures. Finally, we provide an alternative reformulation of the latter problem, which is particularly suitable for the numerical implementation.