

Parsimonious kinematic control for highly redundant robots. Application to generate antropomorphic movement.

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We propose in this talk to introduce a new paradigm for kinematic control of highly redundant robots that provides sparse control vector in the joint space (joint velocity). Indeed, when a robot is highly redundant in comparison to the task to be performed, current control techniques are not “economic” in the sense that they demand, most of the time unnecessarily, all the joints to move. Such a behavior can be undesirable for some applications. In this direction, this work proposes a new control paradigm based on linear programming (LP) that intrinsically provides a parsimonious control strategy, that is, one in which few joints move. We will present the method as well as simulation and experimental results on the HOAP-3 humanoid robot. Finally, a comparison with the pseudoinverse will be detailed as well as a comparison with the postural control on human being showing the same strategy (ankle strategy) for small movement.