

Optimality in Robot Motion

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The talk emphasizes on the distinction between an optimal robot motion and a robot motion resulting from the application of optimization techniques. Most of the time, optimal motions do not exist and when they exist they are difficult to compute. The goal of the talk is to introduce a clear distinction between optimal motion planning and motion optimization. To do so we overview three key points of view that come from different communities (robotics, differential geometry, control, computer science, numerical analysis). They all address optimality in robot motion, but they are rarely gathered into a single presentation. They deal with (i) robot motion planning and control, (ii) motion generation for humanoid robots, and (iii) inverse optimal control, respectively.