## Determination of the Minimum Time and the Optimal Trajectory of a Moving Robot Using Picard's Method

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**Abstract :** This paper presents an optimal control problem applied to a robot; the problem is to determine a command which makes it possible to reach a final state from a given initial state in record time. The approach followed to solve this optimization problem with constraints on the control starts by presenting the equations of motion of the dynamic system then by applying Pontryagin's maximum principle (PMP) to determine the optimal control, and Picard's successive approximation method combined with the shooting method to solve the resulting differential system.

**Keywords :** robotics, Pontryagin's Maximum Principle, PMP, Picard's method, shooting method, non-linear differential systems **Conference Title :** ICAMCS 2020 : International Conference on Applied Mathematics and Compressed Sensing

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