

## **An Approach on Robust Multi Inversion of a Nonlinear Model for an Omni-Directional Mobile**

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**Abstract :** In this paper, a nonlinear controller design for an omnidirectional mobile is presented. The robot controller consists of an inner-loop controller and an outer-loop controller, the first is designed using state feedback (robust allocation) and the second controller is designed based on Robust Multi Inversion (RMI) approach. The objective of RMI controller is rendering the robust inversion of the dynamic, when the model is affected by uncertainties. A model nonlinear MIMO of an omni-directional robot (small-league of Robocup) is used to simulate the RMI approach. The parameters of linear and nonlinear model are varied to cause modelling uncertainties among the model and the real model (real system) generating an error in inner-loop controller signal that must be compensated by RMI controller. The simulation test results show that the RMI is capable of compensating the uncertainties and keep the system stable and controlled under uncertainties.

**Keywords :** robust multi inversion, omni-directional robot, robocup, nonlinear control

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