

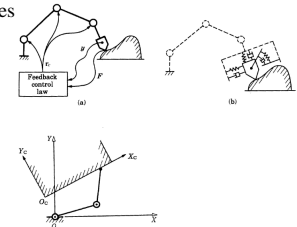
Robot Control

Organizers & Chairs: Joris Deschutter, Tsuneo Yoshikawa

Overview of Robot Control
J. DeSchutter
Katholieke Universiteit Leuven

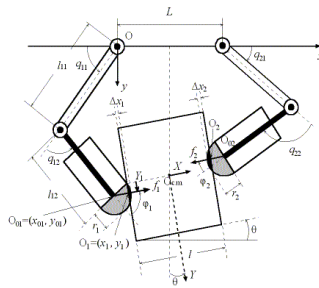
Force Control of Robot Manipulators
T. Yoshikawa
Kyoto University

- Survey of State of the Art of Force Control with 86 References
- Basic Approaches to Force Control
- New Formulation of Premises for Various Approaches
- Brief Survey of Related Research Topics



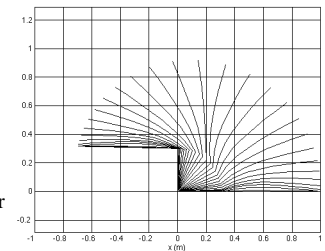
Passivity - Based Control
S. Arimoto
Ritsumeikan University

- Robot dynamics naturally satisfy passivity, which follows directly from a variational form. This leads to design of effective robot controllers.
- Dual two-DOF fingers with soft-tips grasping an object satisfies passivity too, from which separate feedback control signals for 1) stable grasping and 2) regulating rotational angle of the object can be found.
- The overall control signal can be designed by the principle of superposition of such feedback signals.
- These theoretical findings and simulation results show that multi-fingered hands with soft-tips can be used in versatile everyday tasks.



Feedforward/Feedback Laws for the Control of Flexible Robots
Alessandro De Luca
Universit degli Studi di Roma "La Sapienza"

- Model-based feedforward and feedback solution using motor PD law
- New algorithm for rest-to-rest slew in given time for a one-link flexible arm
- Iterative algorithm for end-effector trajectory execution of the two-link FLEXARM

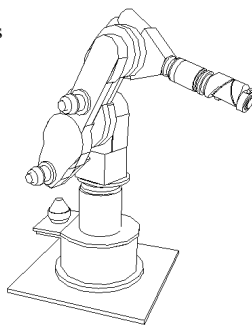


Experimental identification of robot dynamics for control

J. Swevers¹, C. Ganseman¹, X. Chenut² and J. C. Samin²

¹Katholieke Universiteit Leuven and ²Univ. catholique de Louvain

- Design of robot identification experiments for model based robot control.
- Selection of appropriate experiment design and optimization criteria, sensors and model.
- Maximum likelihood estimation, periodic excitation.
- Experimental results illustrate the appropriate choices.



Design of Steering Mechanism and Control of Nonholonomic Trailer Systems

Y. Nakamura¹, H. Ezaki¹, Y. Tan¹ and W. Chung²

¹University of Tokyo and ²Korea Institute of Science and Technology