

Redundant Manipulators

Chairs: Wankyun Chung, Anthony A Maciejewski

Motion Planning for Dynamic Eel Like Robots

K. Mclsaac and J. Ostrowski
University of Pennsylvania

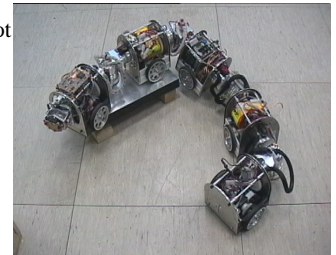
- Motion planning using feedback control for eel robot.
- We use a sampled feedback/feedforward technique, ignoring gait oscillation.
- The robot is approximated using a model of a steerable (Dubins) car.
- We achieve controlled starting, steering and stopping in the plane.



Controlling a Multijoint Robot for Autonomous Sewer Inspection

K. U. Scholl, V. Kepplin, K. Berns and R. Dillmann
Forschungszentrum Informatik Karlsruhe

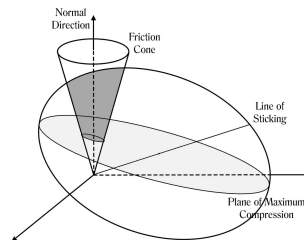
- very flexible autonomous robot
- sensor based motion planning
- successfully passed tests in real sewer pipes
- results led to improvements of mechanical structure



Towards impulsive manipulation: a general algebraic collision model for spatial robots

Ann Ramos Gravagne and Ian D. Walker
Clemson University

- Investigate 3D impact between a robot and its environment
- Modify Chatterjee's algebraic collision law for robotics
- Apply collision law to osprey landing & fishing simulation
- Energetically consistent model of impulsive manipulation is obtained

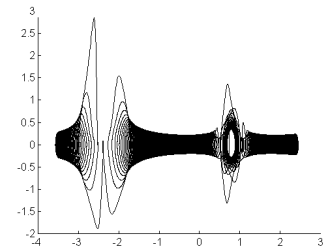


Chaos Dynamics in the Trajectory Control of Redundant Manipulators

F. B. M. Duarte¹ and J. A. T. Machado²

¹Escola Superior Tecnologia Viseu and ²Polytechnic Institute of Porto

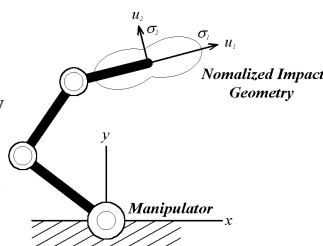
- Kinematic and dynamic control using the generalized inverse control and the Open Loop Manipulability control are analyzed and its performances studied.
- The fractal dimension of the phase-plane joint trajectories, the statistical distribution of the joint variables and the frequency response of the closed-loop system.
- For the pseudoinverse method we have
- The CLP scheme leads to non-optimal responses, both for the manipulability and the repeatability perspectives while the OLM method revealed superior performances.



Normalized Impact Geometry and Performance Index for Redundant Manipulators

J. Kim, W. K. Chung and Y. Youm
Pohang University of Science & Technology (POSTECH)

- Impact Analysis and Control for Redundant Manipulators
- Description of Impact using Normalized Impact Geometry
- Impact Performance Index using Task Velocity Direction
- Guideline of impact control for unknown environment



A New Redundancy-based Iterative Scheme for Avoiding Joint Limits Application to Visual Servoing

Francois Chaumette and Eric Marchand
IRISA - Campus Universitaire de Beaulieu

- Avoiding robot joint limits is crucial in a reactive context
- Classical methods need a tedious gain tuning
- We present an iterative approach without any gain tuning
- The method is validated on a visual servoing gazing task

