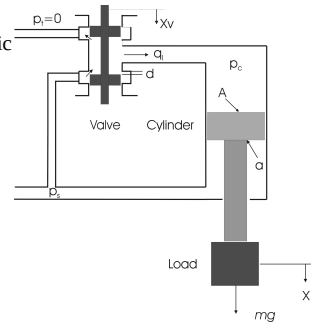
Control 1
Chairs: Roberto Horowitz, Tzyh-Jong Tarn

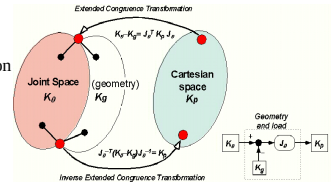
On the Nonlinear Control of Hydraulic Servo-systems
M. R. Sirouspour and S. E. Salcudean
The University of British Columbia

- Position tracking control of hydraulic actuators is addressed
- Nonlinear controllers developed using backstepping
- Simulation and experiments of the schemes presented
- Provably stable method with better performance than PD



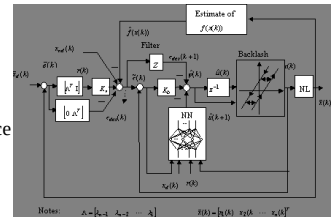
Simulation of Conservative Congruence Transformation: Conservative Properties in the Joint and Cartesian Spaces
Shih-Feng Chen and Imin Kao
SUNY Stony Brook

- Nonconservative Conventional Formulation of Robot Grasping Under Stiffness Control
- Conservative Congruence Transformation (CCT)
- Simulation Results of a Two-link Planar Manipulator
- The CCT Is the Correct Mapping for Stiffness Control in Robotics



Backlash Compensation in Discrete Time Nonlinear Systems Using Dynamic Inversion by Neural Networks
J. Campos, F. L. Lewis and R. Selmic
The University of Texas, Arlington

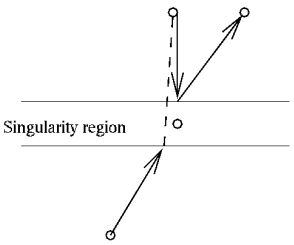
- Backlash is a common problem found in control actuators
- Dynamic inversion by neural networks
- Simulations show better performance over standard PD
- On-line tuning,stability analysis and small tracking errors



A 3-Step Set-Point Control Algorithm for Robot Arms
N. H. Quach and M. Liu
Monash University

Channel Algorithm of Transversal Passing Through Singularities for Non-Redundant Robot Manipulators
Ignacy Duleba
Wroclaw University of Technology

- Find an effective method to pass smoothly through singular configurations.
- The channel algorithm enables to jump through singularity and uses a basic Newton algorithm only. The modified SVD algorithm is used to check successful passing.
- Simulations on the 2-pendulum and the PUMA robot.
- The algorithm enables to smoothly pass through singular configurations.



Design and Experimental Evaluation of a Stable Transition Controller for Geometrically Constrained Robots
P. R. Pagilla and B. Yu
Oklahoma State Universtiy

- Robot transition control from free to constrained motion
- A new discontinuous control algorithm is proposed
- Experiments for a complete robot task with constraint uncertainty
- Stable transition with improved performance is achieved