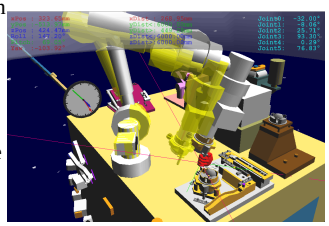
Space and Underwater Robots
Chairs: E. Freund, Nilanjan Sarkar

Application of Automatic Action Planning for Several Work Cells to the German ETS-VII Space Robotics Experiments
E. Freund, K. Hoffmann and J. Rossmann
Universitat Dortmund

- Intuitive Control and Supervision of the robot arm ERA
- Virtual Reality, Action Planning and Multi-Robot-Control
- Simultaneous control of multiple virtual and real robots
- Improvement of the operability

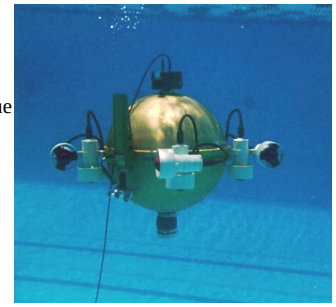


Exact Tracking Control for an Autonomous Helicopter in Hover-like Manouvers
R. Mahony and R. Lozano
Univeriste de Technologie de Compiegne(UTC)

- An Idealized Dynamic Model of a Helicopter
- An Equivalent Model in Block Pure Feedback Form
- Feedback Control to obtain Exact Tracking
- Conclusions

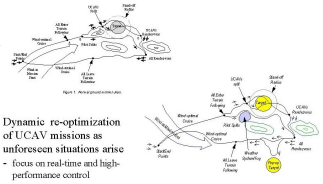
Fault Tolerant Control of an Autonomous Underwater Vehicle Under Thruster Redundancy: Simulations and Experiments
T. Podder, G. Antonelli and N. Sarkar
University of Hawaii at Manoa

- Fault tolerant control of an AUV
- Weighted pseudoinverse technique
- Simulation and experimental results
- Successful tracking of the trajectory with two thruster faults



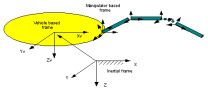
Active Multi-Model Control for Dynamic Maneuver Optimization of Unmanned Air Vehicles
D. Godbole, T. Samad and V. Gopal
Honeywell Technology Center

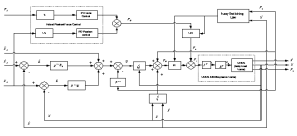
- Problem: Develop dynamic maneuver optimization algorithms for UAVs
- Solution: Wavelet-based multi-resolution maneuver optimization
- Use of evolutionary computing & interior point based optimization techniques
- Allows incremental optimization. Near term trajectory can be designed with detailed models.



A Unified Force Control Approach to Autonomous Underwater Manipulation
Y. Cui and N. Sarkar
University of Hawaii at Manoa

- A unified force control scheme for an autonomous underwater robotic system is proposed
- Fuzzy switching is employed to combine the two force control outputs
- Simulation results indicate that UVMS can contact with the underwater environment in a stable manner and follow the desired force trajectory by the same controller
- A unified force control scheme developed can be used for underwater manipulation





Mission Path Following for An Autonomous Unmanned Airship
J. Azinheira, E. de Paiva, J. Ramos and S. Bueno
Informatics Technology Center, Brazil

- In this article, the authors propose two novel strategies for guidance control of an unmanned airship.
- The first one is based on an H-infinity control technique and the second one is based on PI control.
- Simulated case studies show that both approaches exhibit similar path tracking behavior.
- The H-infinity controller presents a superior performance with respect to disturbance rejection.