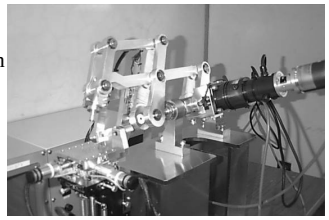
Novel Transmission Methods
Chairs: Ron Fearing, L. Whitcomb

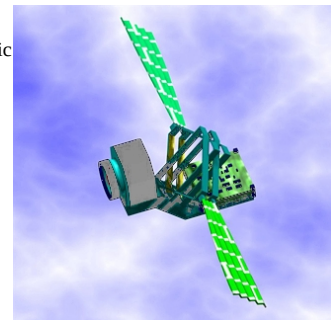
Development of Independently-Controlled Position and Orientation Manipulator for Minute Work
Hiroki Tokashiki[1], Kenji Kaneko[2] and Kazuo Tanie[2]
[1]University of the Ryukus and [2]Mechanical Engineering Laboratory

- Development of new type manipulator
- Independently-controlled position and orienatation mechanism
- Mechanical accuracy of interfernce < 50 micrometer
- Larger workspace and high precision



Wing Transmission for a Micromechanical Flying Insect
R. S. Fearing, K. H. Chiang, M. H. Dickinson, D. L. Pick, M. Sitti and J. Yan
University of California, Berkeley

- design 25 mm wing span biomimetic flying robot
- insect aerodynamics specify wing stroke and rotation
- thorax structures and actuator power requirements
- stainless steel with piezoelectric actuators

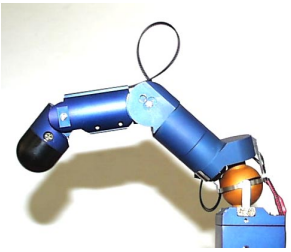


Structural Design and Analysis of a New Semi-Direct Drive Robot Arm: Theory and Experiment
J. Roy, R. Goldberg and L. L. Whitcomb
Johns Hopkins University

- Structural design, analysis, and experimental verification of novel arm
- Design optimized using FEA for high natural frequencies througout workspace
- Extensive structural vibration experiments reported
- Experiments corroborate FEA predictions througout the arm's workspace

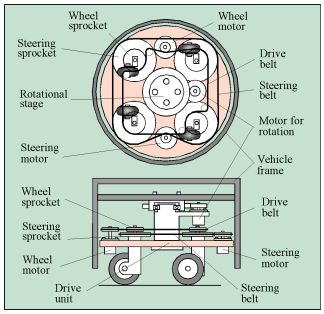
Anthropomorphic Joint Mechanism with Two Degrees of Freedom
H. R. Choi and S. M. Ryew
Sungkyunkwan University

- Two dof metacarpal joint for robot hands mimicking human finger
- Double Active Universal Joint
- Free of rolling, controllable compliance
- Applications: robot hand, inpipe inspection robot



Caster Drive Mechanisms for Holonomic and Omnidirectional Mobile Platforms with no Over Constraint
M. Wada, A. Takagi and S. Mori
Fuji Electric Corporate R&D, Ltd.

- Avoid an over constraint problem on the holonomic wheeled vehicle
- Synchro-drive configuration with decoupled caster drive wheels
- Kinematic and static analysis
- All wheel drive holonomic vehicle with simple kinematics driven by 3 motors



On the Energy Efficiency of CVT-Based Mobile Robots
J. Kim[1], H. Yeom[1], F. C. Park[1], Y. I. Park and M. Kim[2]
[1]Seoul National University and [2]Korean Institute of Science and Technology

- Increasing the run time and efficiency of a mobile robot with S-CVT.
- Development of an optimal control law for minimum energy, together with a numerical simulation based on B-splines.
- Benchmarking the energy efficiency of the CVT-based mobile robot against that of robots employing a reduction gear unit.
- Numerical results indicate that the run time of a mobile robot using a S-CVT can be increased by up to 25