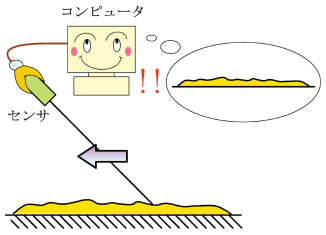
Novel Sensing Devices
Chairs: Makoto Kaneko, Richard Voyles

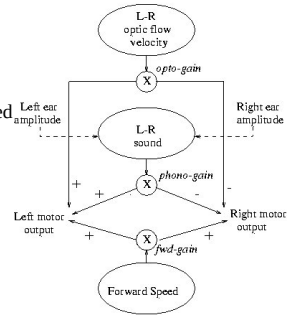
A Whisker Tracing Sensor with 5μm Sensitivity
Makoto Kaneko and Toshio Tsuji
Hiroshima University

- Motivation: Detection of a small burr after drilling process.
- Approach: Whisker sensor anchored at base with torque sensor.
- Result: The sensor can detect irregularities with 5 micro meter.
- Advantage: The sensor can be inserted into a small hole.



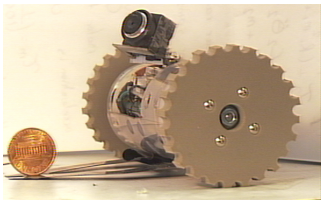
Eyes and ears: combining sensory motor systems modelled on insect physiology
Barbara Webb[1] and Reid Harrison[2]
[1]University of Stirling and [2]California Institute of Technology

- 'Matched filter' sensors could help simplify sensor fusion
- Optomotor aVLSI chip and cricket-inspired sound localisation
- Improved approach path; robot can lock-on to sound
- Need to explore in more challenging motor control task



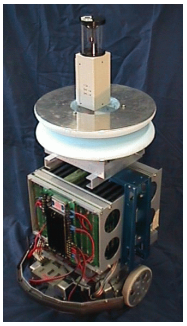
Active Video System for a Miniature Reconnaissance Robot
K. Yesin[1], B. Nelson[1], N. Papanikolopoulos[1], R. Voyles[1] and D. Krantz[2]
[1]University of Minnesota and [2]MTS Systems Corporation

- A pan-tilt video module was built for a miniature mobile reconnaissance robot.
- Severe restrictions on size, weight and power consumption.
- Available technologies for image sensing and actuation are investigated for compatibility with miniature systems.
- The module uses a single-chip CMOS video sensor and 3 mm diameter gearmotors.



Fusion of Omni-directional Sonar and Omni-directional Vision for Environment Recognition of Mobile Robots
T. Yata, A. Ohya and S. Yuta
University of Tsukuba

- New sonar can provide accurate reflecting points.
- Vision can provide edges of wall segment.
- Get environmental feature by fusing based on direction.
- Omni-directional measurement by a single measurement.



Approximating a Single Viewpoint in Panoramic Imaging Devices
Steven Derrien[1] and Kurt G. Konolige[2]
[1]IRISA and [2]SRI International

- Simple panoramic devices that approximate a single viewpoint
- Standard cameras and spherical mirrors can be used
- Real-time dewarping produces perspective images

Suppression of Mechanical Coupling for Parallel Beam Gyroscope
H. Sato[1], T. Fukuda[1], F. Arai[1], K. Itoigawa[2] and Y. Tsukahara[2]
[1]Nagoya University and [2]Tokai Rika Co.,LTD

- We propose new gyroscope using parallel beam structure.
- This gyroscope can converts the Coriolis force into concentrated electric charge.
- Resonance frequency can be easily adjusted by changing the mass of the tip
- Mechanical coupling can be suppressed by applied voltage to sensor unit.