

Human Augmentation and Assist Devices Organizers & Chairs: Harry Asada, Hami Kazerooni

Surface Waves for Active Transport of Bedridden Patients

Joseph Spano and H. H. Asada
Massachusetts Institute of Technology

Design and Control of Human Assisted Walking Robot

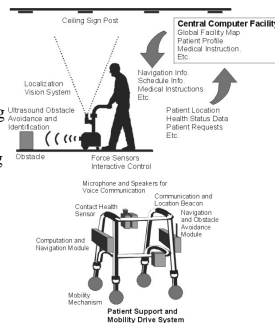
Peter D. Neuhaus and H. Kazerooni
University of California, Berkeley

- Maneuvers Heavy Loads for Extended Periods of Time
- Speed Proportional with Human Force
- Stabilized by Human, Practical
- Powered by an IC Engine

PAMM - A Robotic Aid to the Elderly for Mobility Assistance and Monitoring: A "Helping-Hand" for the Elderly

S. Dubowsky, F. Genot, S. Godding, H. Kozono, A. Skwersky, L. S. Yu and H. Yu
Massachusetts Institute of Technology

- To identify and develop the enabling technologies for a mobility aid and health monitoring system for the elderly.
- Key technologies developed include: Planning and Control, Environmental Mapping, Human-machine Interface, Health Monitoring
- Lab and field tests have shown the feasibility of the concept and demonstrated good performance of the system
- The PAMM system has been well received by the users



Mobile Robot Helper

K. Kosuge, M. Sato and N. Kazamura
Tohoku University

- Human-Robot Cooperation
- Control Algorithm Specifies the Apparent Dynamics of the Object
- Load Sharing is Realized by Introducing Lifting-up/down System
- Human and Robot Execute the Task in Cooperation with Each Other

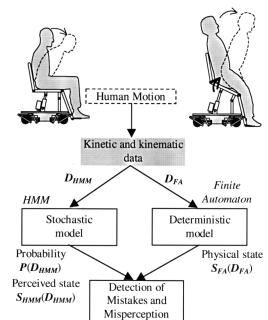


Detection of Human Mistakes and Misrepresentation for Human Perceptive Augmentation: Behavior Monitoring Using Hybrid Hidden Markov Models

M. Hiratsuka^{1, 2} and H. H. Asada²

¹Kawasaki Heavy Industries Co., Ltd. and ²Massachusetts Institute of Technology

- Mistakes and misperception in operating complex systems, such as assist devices for elderly and handicapped people, might lead to a serious accident.
- Standing-up failures are assumed to be caused by mistakes and misperception in a human motion.
- Hidden Markov Models and Finite Automata of a human motion evaluate the appropriateness and the consistency of a human motion.
- Our approach is applied to a standing-up assist device for elderly and handicapped people.



A Human-Robot Interface Using an Interactive Hand Pointer that Projects a Mark in the Real Work Space

Shin Sato and Shigeyuki Sakane
Chuo University

- Projector-based Augmented Reality for human-robot interface
- Tracking an operator's pointing hand and projecting a mark
- Pick-and-place tasks using CCD cameras and infrared cameras
- The IHP is a useful tool for human-robot interaction.

