

Robotics in Medicine

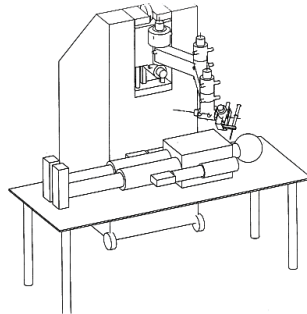
Chairs: Alicia Casals, J. Troccaz

PADyC : a Synergistic Robot for Cardiac Puncturing

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- PADyC : Technical Overview
- Surgical Application : Pericardial Puncture
- Current Status of the Project
- Conclusion



Telerobotic Surgery Control and Safety

A. Rovetta

Politecnico di Milano

- Execution of telesurgery robotic operation, by Internet, ISDN
- Telerobotic system for a prostate biopsy
- Prostate biopsy on a human patient
- Surgical robotics according to the European Normative



Robot Assisted Standing Up

Roman Kamnik and Tadej Bajd

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- A robot assistive device is proposed aimed as a support for the impaired individuals when rising from the sitting to the standing position.
- As a prototype, the 1 DOF instrumented hydraulically driven robot mechanism was built.
- Initial testing and evaluations were accomplished with paraplegic person, who was during standing-up using the arm support and functional electrical stimulation of the paralysed muscles.
- Results confirm the functionality in three possible utilization areas: the device can serve as an functional rehabilitative aid, as a training device or as an assessment tool when studying the standing-up manoeuver.



A Robotic Stepper for Retraining Locomotion in Spinal-Injured Rodents

D. J. Reinkensmeyer¹, W. K. Timoszyk¹, R. D. de Leon², R. Joynes², E. Kwak¹, K. Minakata¹ and V. R. Edgerton²

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- Motivation: Develop a robotic system that controls and quantifies bipedal stepping by spinal-transected rats.
- Techniques: Attach rat's hind limbs to PHANTOM robots and generate a virtual treadmill through haptic simulation.
- Results: Spinal-transected rats could step on the virtual treadmill.
- Conclusions: The virtual treadmill is a new tool for understanding spinal control of stepping and could provide useful data for development of robotic gait-training devices for humans.

A Medical Robotic Assistant for Minimally Invasive Surgery

V. F. Munoz, C. V. Thorbeck, J. G. DeGabriel, J. F. Lozano, E. S.

Badajoz, A. G. Cerezo, R. Tozcano and A. J. Garrido

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Experimental Evaluation of a Robotic Image-Directed Radiation Therapy System

K. Sharma¹, W. S. Newman¹, M. Weinhaus², G. Glosser² and R. Macklis²

¹Case Western Reserve University and ²The Cleveland Clinic

- Motivation: localization of radiation treatment to moving targets
- Approach: human/machine cooperation for interactive exposure gating
- Results: significant reduction in exposure of healthy tissue
- Conclusions: motivates R&D of real-time imaging for cancer treatment

