Robots for Rehabilitation and Personal Independence
Dr Farshid Amirabdollahian
Senior Lecturer in Adaptive Systems
University of Hertfordshire

Agenda
- Welcome note
- Prof Dautenhahn and Dr Amirabdollahian
- Robots for rehabilitation
  - Prof Harwin & Prof Bhakta
- Robots and older people
  - Dr Loureiro & Mrs Baker
- KT-EQUAL
  - Prof Lansley & Prof Mountain
- Human neuroscience and robots
  - Prof Wing & Dr Burdet
- Robots: technology for children
  - Prof Dautenhahn
- Future challenges

Current state of the art

Assistive Robots
Handy 1
Personal Assist
MANUS ARM
Raptor (Mahoney, 2001)
Weston Wheelchair
mounted robot (talk to Dr Hillman from BIME)

Assistive Robots
Handy 1
Personal Assist
Manus
Personal Assist

http://www.rehabrobotics.com
Or see: Topping (2001)

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Prosthetic limbs

- Southampton hand
  - http://www.ecs.soton.ac.uk/research/projects/132
- Hands that feel
  - http://news.bbc.co.uk/1/hi/sci/tech/8313037.stm
- Blatchford smart prosthetics (Endolite)
  - http://www.blatchford.co.uk/

Current state of the art

Rehabilitation Robots

- Gentle/s: upper limb rehabilitation
- Used domain: Stroke therapy

Rehabilitation Robots

- MIT-Manus (Krebs et al. 1998)
- MIME (Burgar et al. 2000)
- ARM-Guide (Reinkensmeyer et al. 2000)
- GENTLE/S (Amirabdollahian et al. 2007)
- GENTLE/G (Loureiro et al. 2007)
- iPAM dual robot (Culmer et al. 2006)
- Southampton workstation
  - With ILC and FES (Freeman et al. 2009)

Social mediators

- Kaspar
  - http://kaspar.feis.herts.ac.uk/
Companion robots

http://paro.jp/english/index.html

Current state of the art

Assistive Rehabilitation

Surgery Social mediators

Dr Farshid Amirabdollahian - Senior Lecturer in Adaptive Systems

Surgery Robots

- Da Vinci
  http://www.intuitivesurgical.com/
- Cyber knife
  http://www.cyberknifecentre.london.co.uk/
- Laparoscopic manipulators for minimally invasive/keyhole surgery
- Micro & Nano Bots
  Bacteribots

Population trends

- Figure 1.2: Demographic changes in Europe (source: Birks, 2007)

Overall trend

- Many more technological solutions are on the rise:
  - Brain-Computer Interface
  - MRI compatible robots
  - EMG-driven
  - FES assistance
  - Wi-habilitation
    * http://www.wihabilitation.co.uk/home.shtml

Future proofing

- User-driven, i.e., based on real needs
  - What do users really want?
  - Needs to be safe
  - Reliable
  - Cheap for home use?
  - Different variations, i.e., for home, hospitals, clinics
  - Needs to prove itself in terms of cost-effectiveness
  - Customisable to each human need (adapt to each individual)
  - We need to learn more about human needs, when older or when recovering or living with disabling conditions
  - This is only possible by having all stakeholders involved, specially end-users
Thank you to KT-EQUAL

- Thanks to Verity Smith
- Thanks to Helen Haigh
- Thanks to Prof Lansley
- Thanks to Prof Gail Mountain

More thanks

- Thanks to our speakers
- Thanks to all for attending
- Hope you will enjoy the talks
- Make new contacts and network
- Hope you will contribute to the forming of the future of these technologies by active participation in discussions and questions

References