WS1 - BEHAVIOR LEARNING THROUGH BODY/ENVIRONMENT INTERACTIONS
IA: Intelligenza Artificiale
Room P16 - 13:30 - 16:30

Abstract
The environment where we live is continuously changing. Behavior adaptation in such unknown environment is now recognized as one of the most significant capabilities of robots for supporting human beings sharing the same environment. Biomimetic approach is one of the most attractive methods to create appropriate behaviors in unknown environment because living organisms have the capability to survive in natural environment creating appropriate behaviors. We are planning a half day workshop to discuss the control architecture for creating robot behaviors adapting their behaviors to the environmental situations in the area from the support of our daily life to specific tasks such as rehabilitation. The key concept of our discussion is body/environment interaction. The environmental inputs should play the role of supervising signal to creating appropriate behaviors of robots otherwise we must use the pre-defined controllers that frequently make unnatural behaviors to unknown environment. We will widely discuss in this workshop from the fundamental computational scheme how environmental inputs are used as the supervising signals, to the application fields of the robot with the adaptability of biological systems, and lead the novel concept of the control scheme for creating the appropriate behaviors in unknown environment.

Organizers
Shingo Shimoda (Brain science institute TOYOTA collaboration center, RIKEN, Japan, shimoda@brain.riken.jp)
Juan C. Moreno (Bioengineering Group, CSIC, je.moreno@csic.es)

Program

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<th>Time</th>
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<tr>
<td>14:00 – 14:10</td>
<td>Opening remarks and workshop introduction</td>
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<tr>
<td>14:10 – 14:30</td>
<td>Pavan Vempaty (Oakland University)</td>
<td>Adaptive Controller for Biped Robot Mimicking Human Gait</td>
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<td>14:30 – 14:50</td>
<td>Jonas Buchli (Italian Institute of Technology)</td>
<td>Robust dynamic walkers</td>
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<td>14:50 – 15:10</td>
<td>Shingo Shimoda (RIKEN)</td>
<td>Tacit learning - a biomimetic learning through behavior experiences</td>
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<td>15:10 – 15:20</td>
<td>Break</td>
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<td>15:20 – 15:40</td>
<td>Yoshihiro Miyake (Tokyo Institute of Technology)</td>
<td>Artifacts Interaction as a Co</td>
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<td>15:40 – 16:00</td>
<td>Wataru Takano (the University of Tokyo)</td>
<td>Scalable Stochastic Modeling of Human Whole Body Motions</td>
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<td>16:00 – 16:20</td>
<td>Juan C. Moreno (Bioengineering Group, CSIC)</td>
<td>Modular control of walking: lessons for design of gait therapies</td>
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<td>16:20 – 16:30</td>
<td>Discussion and Closing remarks</td>
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WS2 - EMBODIED INTELLIGENCE AN EPISTEMOLOGICAL OUTLINE
IA: Intelligenza Artificiale
Room R3 - 13:30 - 18:30

Abstract
The aim of this workshop is to reflect on the emerging topic of the embodied intelligence. We would like to study how could be developed the “Hardware-Artificial Intelligence”. Although since Turing’s times Artificial Intelligence has been conceived in a hierarchical way, mainly software related, now it’s becoming more and more evident that there is another choice: the hardware, non-hierarchical, strongly environment-related intelligence. It is still disputed if this kind of technology can legitimately be called “intelligence”, therefore we want to study its epistemological status in order to first grant a better understanding about what it is, and secondly what it does allow to perform.

Organizers
Giampaolo Ghilardi (g.ghilardi@unicampus.it)
Nicola Di Stefano (n.distefano@unicampus.it)
WS3 - ROBOT-ASSISTED LARYNGEAL MICROSURGERY  
CHIR: Chirurgia  
Room R2 - 9:00 - 12:00

Abstract  
Robot-assisted surgery is a fast-growing field of research, one which has been bringing remarkable advantages to various fields of surgery, especially to the field of laparoscopy. These include elimination of tremor, motion scaling, enhanced visualization, and ergonomic control. However, microsurgery remains a vastly unexplored territory for robot-assisted systems despite the fact they can have an even greater impact here. At the same time, demand for new tools and platforms for enhanced surgical and patient outcomes is growing. One example is seen in the area of laryngology, which often involves very delicate operations on organs such as the vocal fold.

Organizers  
Leonardo Mattos (Advanced Robotics Dept. Istituto Italiano di Tecnologia, Genoa, Italy, leonardo.demattos@iit.it)  
Nicolas Andreff (FEMTO-ST / University of Franche-Comté, Besançon, France, nicolas.andreff@femto-st.fr)

Confirmed speakers  
Giorgio Peretti, Director, Otolaryngology Clinic, Università degli Studi di Genova, Italy  
Lionel Pazard, Clinical Researcher, University Hospital of Besançon, France  
Edward Grant, Director, Center for Robotics and Intelligent Machines, NCSU, USA  
Tobias Ortmaier, Director, Institute of Mechatronic Systems, Leibniz Universität Hannover, Germany

WS4 - FUTURE TRENDS IN MEDICAL AND REHABILITATION ROBOTICS - METHODOLOGICAL ROBOTICS  
ROB MED: Robotica Medica  
Room P13 - 14:00 - 16:30

Abstract  
With the advent of an aging society all over the world, there will be an increased demand for the practical application of RT (Robot Technology) in medical fields – in fact, it is expected that this demand will lead to the creation of new key industries in future. Thus, the main objectives of this workshop are to discuss the future trend on medical robot (especially, rehabilitation, assistive, surgical, diagnosis robot) as well as the innovative and interesting research activities in robotics. Since the dissemination of medical RT will have a wide-ranging effect on people and society, the integration of a variety of academic fields is also needed, including robotics, mechatronics, rehabilitation, medicine, physiology and neuroscience, etc. Then, technical topics include various topics such as surgical and diagnostic robot, assistive and rehabilitation robot, neuro rehabilitation, biomechanical model and modeling and control for medical robot.

We will highlight the most innovative and interesting multidisciplinary research activities related with medical robotics. From the discussion, we plan to discuss and find future trend on medical robotics. We also discuss about how to do multidisciplinary research activities because most of useful robot in society may be generated only from multidisciplinary researches. Our goal is to increase the focus on the fundamental technology for medical robotics for the purpose to accelerate the actual application of RT world widely and to foster young researchers to work on RT with a multidisciplinary perspective.

Organizers  
Masakatsu G. Fujie (Faculty of Science & Engineering, Waseda University, Japan, mgfujie@waseda.jp)  
Hiroyasu Iwata (Waseda Institute for Advanced Study, Waseda University, Japan, jubi@waseda.jp)  
Yo Kobayashi (Faculty of Science & Engineering, Waseda University, Japan, youk@fujie.waseda.jp)

Program

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<td>14:00 – 14:20</td>
<td>Masakatsu G. Fujie (Waseda University, Japan)</td>
<td>Topic: Rehabilitation robot</td>
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<td>14:20 – 14:40</td>
<td>Jung Kim (KAIST, Korea)</td>
<td>Topic: Rehabilitation robot</td>
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<tr>
<td>14:50 – 15:00</td>
<td>Hiroyasu Iwata (Waseda University, Japan)</td>
<td>Topic: Rehabilitation robot</td>
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<td>15:00 – 15:20</td>
<td>Mamoru Mitsuishi (The University of Tokyo, Japan)</td>
<td>Topic: Medical robot</td>
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<td>15:20 – 15:40</td>
<td>Arianna Menciassi (Scuola Superiore Sant’Anna, Italy)</td>
<td>Topic: Medical robot -Title: Surgical robotics: a quest for miniaturization</td>
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<td>15:40 – 16:00</td>
<td>Ryoichi Nakamura (Chiba University, Japan)</td>
<td>Topic: Medical robot - Title: Navigation-based intuitive guidance and analysisys for robotics in minimally invasive surgery</td>
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<tr>
<td>16:00 – 16:10</td>
<td>Break</td>
<td>Discussion</td>
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<td>16:10 – 16:30</td>
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WS5 - BIOLOGICALLY INSPIRED APPROACHES TO MULTI-MODAL ROBOTIC LOCOMOTION

LOC: Locomotion
Room P9 - 13:30 - 18:30

Abstract
Recent research in robotic locomotion, in particular efforts drawing upon inspiration from biology, has resulted in remarkable progress towards mobile platforms with the capacity to traverse challenging environments. However, there remain significant issues which have impeded the development of truly robust ambulatory platforms capable of locomotion in more than one medium; this dearth has resulted in a plateau in the present utility of autonomous and semi-autonomous vehicles. Specifically, the challenges of transitioning between combinations of aerial, aquatic, and terrestrial modes of locomotion present an array of issues in sensor development, energy consumption, mechanical design, sensor integration, perception and planning, and control system development. At this time, the system design issues involved in creating a hybrid vehicle capable of morphing locomotion modalities have yet to be fully clarified by the research community. In follow-up to a highly successful workshop at the IEEE International Conference on Intelligent Robots and Systems (IROS), The IEEE Robotics and Automation Society Technical Advisory Committee (TAC) on Biorobotics is soliciting contributions for a half-day workshop to provide a forum for discussion in regard to new research addressing systems-level issues as they pertain to robots and sensor platforms with the capacity for multiple modes of locomotion. This workshop will take place as a part of the 2012 IEEE International Conference on Biomedical Robotics and Biomechatronics (BioRob, June 24-28, Rome, Italy). Ideally, the exchange of ideas will spur new research efforts targeting the creation of mobile robots synergizing mechanical and control subsystems to achieve the adaptability and robustness necessary for multi-modal locomotion.

Organizers
Ravi Vaidyanathan (r.vaidyanathan@imperial.ac.uk)
Low Kin Huat (mkhlow@ntu.edu.sg)

WS6 - MODELING HUMAN AND HUMANOID LOCOMOTION

LOC: Locomotion
Room R5 - 9:00 - 17:00

Abstract
The model-based investigation of dynamic motions of anthropomorphic systems is an important research topic in humanoid robotics, biomechanics and computer animation. Basic locomotion forms such as walking and running is of particular interest due to the high demand on dynamic coordination, actuator efficiency and balance control, as well as steering decisions. Mathematical models and numerical simulation and optimization techniques - in combination with experimental data - can help to better understand and improve the basic underlying mechanisms of healthy and pathological locomotion, e.g. in sports or after an accident or an illness. Mathematical models can also serve to control locomotion of humans walking with a prosthetic device, an orthosis or exoskeleton, or even assist the design of these devices. In addition, models help to do the transfer from recorded human experiments to a humanoid platform in a way that produces feasible motions for the humanoid. There are two different levels at which human and humanoid locomotion can be studied:

- The generation of motions and torques on the joint level which usually is driven by laws of energy consumption, stability, fatigue minimization or the placement of a foot on a given foothold;
- the trajectories of the human or humanoid as a whole in space that are chosen to walk to a given target in free space, to avoid obstacles or interact with other humans or humanoids.

Both topics are represented in this workshop. The establishment of good locomotion models is a highly interdisciplinary research task. The goal of this full-day workshop at IEEE BioRob 2012 is to gather researchers of all related fields to promote the interdisciplinary discussion.

Organizers
Katja Mombaur (IWR, University of Heidelberg, Germany, katja.mombaur@iwr.uni-heidelberg.de)
Jean-Paul Laumond (LAAS-CNRS, Toulouse and College de France, Paris, France, jpl@laas.fr)
Philippe Soueres (LAAS-CNRS, Toulouse, France, soueres@laas.fr)

Confirmed speakers
Tamim Asfour, KIT, Germany: Whole-Body Motion Generation Based on Motion Primitives
Armel Crétual, Univ Rennes 2, France: Realistic Modeling of 1 vs. 1 Interactions during Locomotion
Tamar Flash, Weizman Institute, Israel: Trajectory formation and intersegmental coordination principles during human locomotion
Martin Giese, University of Tübingen, Germany : Stability in the formation of collective human locomotion patterns
Jean-Paul Laumond, LAAS-CNRS, France: Locomotion and robotic action space
Tobias Meilingr, MPI Tübingen, Germany: Modeling errors in human navigation
Katja Mombaur, University of Heidelberg, Germany: Modeling of fast running motions with prostheses
Francesco Nori, IIT, Genoa, Italy: Modeling crawling locomotion for the iCub robot
Yann Perrot, CEA, Paris, France: Modeling exoskeletons
Julien Pettre, INRIA Rennes, France: Realistic Modeling of Follower Locomotion Behavior
Philippe Souères, LAAS-CNRS, France: A multisensory root as a key principle to simplify the observation and control of anthropomorphic systems
Manish Sreenivasa, University of Tokyo, Japan: Researching Locomotion: Perspectives, synergies and pitfalls from methods in Neuroscience, Bio-mechanics and Robotics
Emo Todorov, University of Washington, Optimizing through contacts: A framework for automatic synthesis of complex behaviors
WS7 - “BRAIN-COMPUTER INTERFACE” HALF-DAY TUTORIAL & HANDS-ON SEMINAR
BMI: Brain-Machine Interfaces
Room P10 - 13:30 - 18:30

Abstract
Research groups all over the world are working feverishly and successfully on a direct connection between the human brain and a computer, a so-called Brain-Computer Interface (BCI). A brain-computer interface translates brain waves into control signals. In recent years, BCIs have been developed for people with severe disabilities to improve their quality of life. BCI systems can be used for many applications, such as restoration of movements, communication, and environmental control. During our upcoming workshop tour, we will demonstrate major concepts for BCI control by using motor imagery, P300 and steady state evoked potentials (SSVEP) for spelling and robot control. New trends like active and dry EEG electrodes and invasive ECoG based systems will be explained. This allows the audience to see all required hardware and software, the typical training and classifier setup, and the overall performance in real-world settings. We will invite people from the auditorium to participate in the live demonstrations.

Organizers
Barbara Vogt (vogt@gtec.at)
Rupert Ortner (prueckl@gtec.at)

Time schedule
Welcome, introduction

Introduction to 4 major methodological approaches of BCI

Practical part: introduction to hard- and software

Hands-on sessions: P300-Speller, SSVEP-BCI, Motor imagery BCI

Final discussion & questions

WS8 - ROBOTICS FOR NEURO-REHABILITATION: CHALLENGES FOR IMPROVING IMPACT ON CLINICAL PRACTICE
RIAB: Riabilitazione
Room R4 - 9:00 - 18:30

Organizers
Stefano Mazzoleni (The BioRobotics Institute, Scuola Superiore Sant’Anna, Pisa, Italy, s.mazzoleni@sssup.it)
Marco Franceschini (IRCCS San Raffaele Pisana, Roma, Italy, marlo.franceschini@sanraffaele.it)
Federico Posteraro (Auxilium Vitae Rehabilitation Centre, Volterra, Italy, f.posteraro@riabilitazione-volterra.it)

Program
Registration and Welcome (9.00-9:30)
Invited Talk Session I: Understanding Motor Learning and Motor Recovery (9:30 – 11.30)
Moderators: M. Johnson and M. Franceschini
09:30 – 09:45 P.M. Rossini (Policlinico Gemelli, Roma, Italy)
09:45 – 10:00 A.C. Lo (Providence Veterans Affairs Medical Center, USA)
10:00 – 10:15 "Stroke rehabilitation inspired by computational neuroscience" - R. Osu (ATR, Kyoto, Japan)
10:15 – 10:30 "Sensorimotor tricks to facilitate motor recovery" - E. Burdet (Imperial College London, UK)
10:30 – 10:45 "Using assistive robotic technology to study physiological aspects of muscle function during stroke recovery" - D. Turner (University East London, UK)
10:45 – 11:00 "The impact of improving challenge in clinical practice" - J. Patton (University of Illinois, Chicago, USA)
11:00 – 11:15 "Motor recovery assessment during robot-assisted neurorehabilitation of sub-acute and chronic stroke patients" - R. Colombo (Fondazione Maugeri, Pavia, Italy)
11:15 – 11:30 "Data not always support clinical practices" - H.I. Krebs (MIT, Boston, USA)

Discussion (11:30 – 12:00)
Break and Lunch (12.00-13.30)
Invited Talk Session II: Methods and techniques for assessment (13.30 – 14.45)
Moderators: A.C. Lo and P. Tomin (IRCCS San Camillo, Venezia, Italy)
13:30 – 13:45 "Semantic Conditioning in a BCI setting" - D. De Massari (Universität Tübingen, Germany)
13:45 – 14:00 "Systematic review of outcome measures of walking training using electromechanical and robotic devices in patients with stroke" - C. Geroin and S. Mazzoleni (University of Verona, Italy and SSSA, Pisa, Italy)
14:00 – 14:15 "The challenges of assessment" - A. M. Hughes (University of Southampton, UK)
14:15 – 14:30 "Strategies for robot driven rehabilitation: what matters?" - R. Loureiro (Middlesex University, UK)
14:30 – 14:45 "Arm and locomotor study: outcome and efficiency in neurological rehabilitation" – N. Schattat (Medical Park/Charité University, Berlin, Germany)

Discussion (14:45 – 15:00)
Invited Talk Session III: Robot-assisted therapy: novel protocols and innovative human-robot interaction modalities (15:00 – 16:45)
Moderators: D. Turner and S. Mazzoleni
15:00 – 15:15 P. Dario (SSSA, Italy)
15:15 – 15:30 "Neural plasticity after task-oriented robot therapy" - M. Johnson (Marquette University, USA)
15:30 – 15:45 "Performance, biomechanics and psychophysiological responses in multimodal rehabilitation environment" - M. Munih (University of Ljubljana, Slovenia)
WS9 - ROBOTIC THERAPY FOR UPPER AND LOWER EXTREMITY: FROM THE NEUROSCIENCE AT THE BENCHSIDE TO THE IMPLEMENTATION AT THE BEDSIDE
RIAB: Riabilitazione
Room R1 - 9:00 - 18:30

Abstract
The field of rehabilitation and therapeutic robotics has grown steadily over the past decade, with significant clinical contributions. Studies have demonstrated both the efficacy and advantages of robotics for assessing and treating motor impairment. Robotics and information technologies enable an overdue transformation of rehabilitation clinics from pre-industrial manual operations to technology-rich activities and there is significant opportunity for engineers in this area.

Organizers
Hermano Igo Krebs (hikrebs@mit.edu)

Confirmed speakers
Dagmar Sternad
Hermano Igo Krebs
Robert Riener
Olivier Lambery
James Patton
Neville Hogan
Arturo Forner Cordero
Eugenio Guglielmelli
Sunil Agrawal
Glauco Cairin

WS10 - INNOVATIVE TECHNOLOGIES FOR REHABILITATION EXOSKELETONS
RIAB: Riabilitazione
Room R6 - 9:00 - 16:30

Abstract
Exoskeletons are becoming more and more popular to deliver specific rehabilitation treatments, mainly, electromechanical assisted training robots for training and compensation of function in non-ambulant patients. Exoskeletal robot technologies provide versatile control approaches as a framework for design of optimal rehabilitation interventions and experimental motor control studies. In order for exoskeletal rehabilitation robots to have a higher impact in the treatment of affected populations, improved transmission of motor actions to the human limbs, optimized control of the interaction efficient and compact solutions should be further researched. Exoskeletal rehabilitation robots can be driven by volitional commands to control movement of paralyzed or weak limbs. The potential of novel approaches to both enable and rehabilitate motor function with repeatability and flexibility, makes them an attractive instrument to develop and evaluate neurorehabilitation concepts to manage motor disorders.

The purpose of this full-day workshop is to discuss key engineering challenges that need to be overcome in order to increase the impact and feasibility of exoskeleton robots in real clinical environments, as rehabilitation aids and training tools. In this workshop, we will widely discuss on: control approaches and architectures, actuator and power technologies, sensors for human-robot interaction, monitoring techniques and wireless networks, among others.

Organizers
José María Azorin (Universidad Miguel Hernández de Elche, Elche, Spain, jm.azorin@umh.es)
Juan C. Moreno (Bioengineering Group, CSIC, Arganda del Rey, Madrid, Spain, jc.moreno@csic.es)
Fernando Brunetti (Bioengineering Group, CSIC, Arganda del Rey, Madrid, Spain, Universidad Católica "Nuestra Señora de la Asunción", Asunción, Paraguay, f.brunetti@csic.es)

Program
9:00 - 9:10 Introduction (Jose M. Azorin, Juan C. Moreno, Fernando Brunetti)
9:10 - 9:30 Hybrid FES-robot cooperative control of ambulatory gait rehabilitation exoskeleton for SCI users (Antonio J. del Ama, Toledo Spinal Cord Injury Hospital, Spain)
9:30 - 10.00 Functional Assisting of human lower limbs for movement restoration (Sammer Mohammed, University of Paris-Est Creteil Val de Marne, UPEC)
10:00 - 10.30 (to be confirmed) Novel compliant actuators for rehabilitation exoskeletons (Dirk Lefeber, Vrije Universiteit Brussel, Belgium)
10:30- 11.00a Development of Robotic System with Artificial Vision for the Evaluation of Rehabilitation in Underwater Gait Therapy (Luis Eduardo Rodriguez, Escuela Colombiana de Ingeniería, Colombia)
11.00 – 11.30 Advances and challenges in wireless body sensor networks for monitoring and control in rehabilitation of movement (Carlos Cifuentes, Unitec University, Colombia)
11:30 – 12.00 Functional Electrical Stimulators for Neurorobotics (Fernando Brunetti, Universidad, Paraguay)
12:00 – 12.30 Reducing muscle fatigue during FES (Robert Nguyen, ETHZ, Zurich)
12:30 – 14.00 Lunch time
14:00 – 14:30 Development of a Cooperation Strategy between a Robotic Walker and Lower Limb Exoskeleton for Human Gait Assistance (Anselmo Frizera Neto, UFES, Brazil)
14:30 – 15:00 Rehabilitation robots as alternative treatment of tremor (Eduardo Rocon, Bioengineering Group-CSIC, Spain)
15:00 – 15:30 Using Brain-Machine Interfaces in Rehabilitation Robotics (José M. Azorin, Universidad Miguel Hernández de Elche, Spain)
15:30 – 16:30 Poster session of the participants
Patients needing prolonged mechanical ventilation (MV) having high resource utilisation and relatively poor outcomes, especially the elderly, are increasing in number. The optimal use of mechanical ventilators in the clinical practice represents a challenging field of research. The collaboration between medical experts and bioengineers yet contributed to the advances in the field of development of innovative strategies for respiratory rehabilitation, including e-health technologies and experimental clinical services. The need for improving the patient-ventilator interaction, even at distance, provides the background for future research efforts and collaboration between bioengineers and physicians.

Organizers
Stefano Mazzoleni (The BioRobotics Institute, Scuola Superiore Sant’Anna, Pisa, Italy, s.mazzoleni@sssup.it)
Nicolino Ambrosino (Azienda Ospedaliero-Universitaria Pisana, Italy, n.ambrosino@ao-pisa.toscana.it)
Michele Vitacca (IRCCS Fondazione Salvatore Maugeri, Lumezzane, Italy, michele.vitacca@fsm.it)
Guido Vagheggini (Auxilium Vitae Rehabilitation Centre, Volterra, Italy, guidovagheggini@ibiero.it)

Program
Registration and Welcome (8:30–8:45)
Invited Talk Session - Chairperson: N. Ambrosino (University Hospital of Pisa, Italy)
9:00 – 9:30 Basics of Mechanical Ventilation: patient-ventilator interaction (G. Vagheggini, Auxilium Vitae Rehabilitation Centre, Volterra, Italy)
9:30 – 10:15 Pulmonary ventilators as monitoring instruments: measurements and common issues (S. Silvestri, Università Campus Bio-medico, Roma, Italy)
10:15 – 11:00 Telemonitoring of mechanically ventilated patients (M. Vitacca, IRCCS Fondazione Salvatore Maugeri, Lumezzane, Italy)
11:00 – 11:45 Automatic tailoring and remote control of ventilators (R. Dellacà, L. Govoni, Politecnico di Milano, Italy)
11:45 – 12:00 Roadmap for an European network (S. Mazzoleni, Scuola Superiore Sant’Anna, Pisa, Italy)

Abstract
Robots for Neurorehabilitation have become more popular in the last years despite the lack of clear evidence. Nevertheless there are many positive results and important questions to be answered are:
- For which patient groups and pathologies are rehabilitation robotics effective and efficient?
- What technological aspects still need to be solved?
- How can results from neuroscience and motor control research be efficiently implemented?
- What is the future potential of the technology?
The main objective of the first COST Action year was to provide a clear structured overview about existing and emerging robot-assisted therapies for clinicians and therapists, so they can increase the availability of effective, standardised clinical practice across Europe. An interdisciplinary team of leading researchers from robot engineering, clinical motor neurorehabilitation, computational neuroscience and motor neuroimaging carries out the Action.
The working group leaders will disseminate in a half day workshop their first results and discuss with representatives of other rehabilitation robotics organizations possible directions future objectives of the field.

Organizers
Thierry Keller (thierry.keller@tecnalia.com)
Rui Loureiro (r.loureiro@mdx.ac.uk)