The confluence of two converging phenomena is set to dramatically transform the society in the next decades. The first is the ageing of the world population, which is reaching unprecedented levels. The second is the accelerated development of advanced technologies, from assistive robotics to breakthrough genetic therapies, that are revolutionizing healthcare and offer promise in assistance to elders, and cures for previously incurable diseases. This is the dawn of a new age in using advanced technologies to dramatically enhance quality of life.

AT-EQUAL meetings (standing for Advanced Technologies for Enhanced Quality of Life) aim to foster scientific exchange within this confluence field. Intended as a yearly forum of international academic and educational exchanges, the AT-EQUAL series proposes to bring together technical scientists, life scientists and medical doctors to share latest knowledge, present/demonstrate new techniques, and discuss future avenues in using technology to enhance quality of life.

AT-EQUAL 2009, held in Iasi, Romania, was the first event in the series. Its overarching theme was “Robotics in Healthcare and Rehabilitation”. It consisted of two symposia, LAB-RS 2009 (“Learning and Adaptive Behaviors in Robotic Systems”) and ARTIPED 2009 (“Assistive and Recuperative Technologies for Injured, ill Pregnant, Elderly and people with Disabilities”), combined with a summer school, ISRIS 2009 (International School on Robotics and Intelligent Systems), which was focused on “Assistive robots and systems for healthcare and rehabilitation”.

LAB-RS Symposia focus on providing a forum for advancement of learning and adaptation in robotics systems to high capability levels comparable to those of biological systems. It seeks reports on new concepts, laboratory demonstrations, and fielded robotic systems that exhibit learning and adaptive behaviors. The focus of the LABRS 2009 symposium was learning and adaptive behavior in robots working within environments in close proximity to other robots and humans.

ARTIPED was created as a forum to discuss assistive and recuperative technologies that will have the most impact on humans health and quality of life in the coming decade. The range of topics of interest is broad across diverse technologies, including the development and use of (a) new materials and structures, procedures, robotics and prosthetic devices, information technologies supporting diagnostic and intervention, computerized diagnostic, monitoring and therapy, organ/tissue/blood/marrow preservation banks; (b) biotechnologies, managed healthcare, neuro-robotics, biofeedback devices, bioinformatics, human genetic engineering, genetic technologies for therapy and enhancement; (c) new techniques and technologies in neurosurgery, brain implants, neuro/brain-machine interfaces and control, stem cells engineering, tissue engineering, artificial and bio-artificial organs, novel medical devices and systems, etc. A special focus of ARTIPED 2009 was on technologies benefiting from the revolution in robotics and prosthetic devices, with papers covering topics in (a) therapeutic and surgery robots for minimally invasive and remote operation procedures; (b) Assistive and caregiving robotics and systems; (c) Endoprosthetic devices, technologies and procedures for restoring functionality; (d) Exoprosthetic devices, technologies and procedures, exoskeletons and other systems for restoring mobility; (e) Prosthetic technologies for systems for coping with perception, control and communication impairments (hearing, speech, and vision assistive systems, brain-machine interfaces and control, neuro-robotics); (f) Robotics and automation in genetic/stem cell/tissue engineering, intelligent information processing in new devices and robots.

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