UNIVERSITÀ DEGLI STUDI DI BOLOGNA

FACOLTÀ DI INGEGNERIA

CONFERENZA DI FACOLTÀ

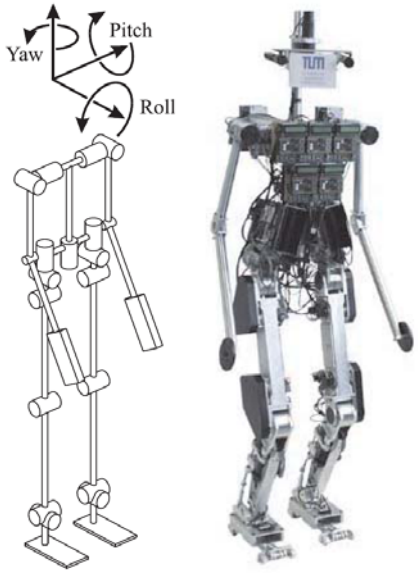
In occasione del conferimento della Laurea honoris causa
in Ingegneria Meccanica il

Prof. Friedrich Pfeiffer

Lehrstuhl fuer Angewandte Mechanik
TU-Muenchen

terrà una lezione sul tema

The Problem of Fast MachineWalking



presso la Facoltà di Ingegneria, viale Risorgimento 2, Bologna,
Aula Magna "Enrico Mattei"
Mercoledì, 27 febbraio 2008, ore 17:00

Gli interessati sono cordialmente invitati

The Problem of Fast Machine Walking

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Summary

Walking is a fascinating invention of nature. It is versatile, flexible and perfectly adapted to a natural environment. Walking in its various realizations enables the biological systems to have access to all the natural structures of the earth. Walking realizes motion, and motion with motion planning is the basis for intelligence, as modern biologists state. If intelligence is defined as the ability to deal with unknown and new situations, biological movement, both mental and physical, can be considered as a manifestation of intelligence.

Walking has been detected by engineers some 20-30 years ago, although before that time numerous trials had been made to realize some mechanisms with walking capabilities. Nowadays the computer age and a large variety of sophisticated technologies give walking machine realizations a high probability of success. My group at the Technical University of Munich started in 1989 to design and to realize a six-legged walking machine MAX, which followed very closely the neurobiological findings by Professor Cruse in Bielefeld with respect to the control of walking stick insects. Although this machine is already 12 years old, its control concept is still very modern and in the area of neurobiology a matter of ongoing research. Without any central surveillance the control of MAX is completely autonomous, also in uneven terrain.

The six-legged machine MAX was followed by the eight-legged machine MORITZ, which was able to walk in tubes of any position and orientation, and the control of which possesses on a lower level that of MAX supplemented by a high-level structure being able to manage the contact forces at the foot-contacts at the inner tube wall. After these research results a large priority project of the German Research Foundation (DFG) enabled the Institute to develop a biped machine with a certain degree of autonomy, which could be achieved by the combination of the two-legged machine JOHNNIE. JOHNNIE is a light-weight design with 17 joints, a height of 1.80 m and a weight of about 40 kg. The talk will present more details.

CV:1935 Wiesbaden, Germany; 1955 school-leaving exam — 1961 Dipl.-Ing. mechanical engineering, 1965 Dr.-Ing. aerodynamics, both TH-Darmstadt — 1966-1982 Blkow GmbH. and MBB (Messerschmitt-Blkow-Blohm), aerospace industry; 8 years space division, 8 years guided missile division, in various positions; department head for space dynamics; project manager guided missile; president propellant-producing company; vice-president R&D guided missile division — 1982 full professor TU-Munich, mechanical engineering, chair applied mechanics; 1993-95 dean of the faculty, senate member, various committees, industry consultant, 2001 retirement, now ”emeriti of excellence” — about 20.000 students in 20 years, more than 80 dissertations — member ASME(fellow), IEEE(fellow), IUTAM, EUROMECH, GAMM(president 2001-2003), VDI, DGLR — editor activities for journals and book series — many awards, Dr.-Ing.E.h. Dresden, Dr.h.c. Moscow(RAS), member RAS Moscow, Prof. Tongji Shanghai, order of merits Germany and Bavaria, and others — more than 200 publications, 6 books.