Old robots and new robots

Professor Gurvinder S Virk
Professor of Robotics and Associate Head
Institute of Technology and Engineering, Massey University
Private Box 756, Wellington, New Zealand
Tel: +64 4 801 0806; g.s.virk@massey.ac.nz

Abstract

The area of robotics is widening to meet the needs of the aging society. Here the need for developing and adopting robotized solutions in new non-industrial applications where human-robot interactions are central to achieving the requirements needed. The emerging applications demand new type of "service robots" rather than the traditional and available "manufacturing robots" for "industrial environments". The differences in the traditional robots and new service robots of the future and their respective operational environments will be highlighted. Some case study examples of innovative service robots that have been developed will be presented. The drivers for achieving the new robots and the barriers to be overcome will be discussed. These are leading to new standardization and ethical activities and the presentation will include the latest activities being carried out under ISO in developing standards for robots in personal care.

Biographical information

Professor Gurvinder S Virk is Associate Head of the Institute of Technology and Engineering at Massey, Wellington. Gurvinder S Virk graduated with 1st class honours in electrical and electronic engineering from the University of Manchester and went on to obtain a PhD in control theory from Imperial College, London in 1982. Since then he has followed an academic career working at Sheffield City Polytechnic, Universities of Southampton, Sheffield, Bradford, Portsmouth and Leeds. He has recently moved to Massey University in February 2007.

Professor Virk's research interests cover a wide area of robotics and control systems engineering and applications (both theoretical and applied aspects). His current main research projects are in mobile robotics with special emphasis on climbing and walking robots (CLAWAR) and smelling robots, building and energy management systems, and the use of advanced model-based control in the variety of applications. He has published heavily in these areas and has produced over 230 publications, including four books. He has held several grants from UK and European sources, as well as industry; the total value of research contracts secured is £11.3M. He coordinated the successful European Network of Excellence on Climbing and walking robots that has initiated considerable work on robot component modularisation and robot standardization to encourage the rapid development and adoption of robotised solutions in new sectors.

He has been involved in several projects to develop innovative robots for exploring volcanic environments, inspection of highway bridges and dams, robotic assistive technologies for biomedical applications. He was chairman of the ISO TC184/SC2 Advisory Group on Standards for mobile service robots that has formulated the standards requirements for service applications where close robot-human interaction and collaboration are essential. He is chairman of the new ISO standardization project team on Personal care robots.

He is Fellow of the Institution of Engineering and Technology, Fellow of the Chartered Institution of Building Services Engineers, Fellow of the Institution of Applied Mathematics and Its Applications. He is Chartered Engineer and a Chartered Mathematician. He has been awarded the Freedom of the City of London for his work in promoting Information Technology.