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New Generation of Robots

Nowadays, in the population-aging society, robotic systems have been developed to provide some basic services to aid the aged or disabled in gaining independence in important daily living activities. They can have a significant effect on the wellbeing and quality of life of the individual.

Fingripper is a bionic handling assistant designed by Festo and Fraunhofer IPA institute. It can hand the glasses to the elderly women and men in a residential home, who are no longer able to manage the daily life by themselves. In the future, there may be other service robots feeding the partly handicapped. Other robots may clean the room, open the window on voice command, and distribute the medicine right on time and to the right person. They even may dose the necessary medicine and apply it. The first prototypes of such service robots for healthcare and elderly care are already under development. All those service robots have one common one common feature: they are battery-powered and freely moveable. This requires light-weighted mechanics and a minimum of electrical power consuming actuators and electronics. Those service robots are equipped with a multitude of sensors communicating via smart controllers in order to perform the desired actuation.

Smart Grippers are an essential part of many service robots. They require very small actuators, mainly electrical DC motors. CAN-connectable tiny motors are already available. Integrating them into a human-hand like sub-system with sensors and interfacing them on a higher-level is the challenge. Such a higher-level interface could be integrated in a CAN-based backbone network, which connects the smart gripping sub-system to other parts of the service robot.

One of the most progressive robots is a mobile one. Mobile robots have the capability to move around in their environment and are not fixed to one physical location. An example of a mobile robot that is in common use today is the automated guided vehicle or automatic guided vehicle (AGV). An AGV is a mobile robot that follows markers or wires in the floor, or uses vision or lasers.

Mobile robots are also found in industry, military and security environments. They also appear as consumer products, for entertainment or to perform certain tasks in everyday life. Mobile robots are the focus of a great deal of current research and almost every major university has one or more labs that focus on mobile robot research. Modern robots are usually used in tightly controlled environments such as on assembly lines because they have difficulty responding to unexpected interference. Because of this most humans rarely encounter robots.

However domestic robots for cleaning and maintenance are increasingly common in and around homes in developed countries.