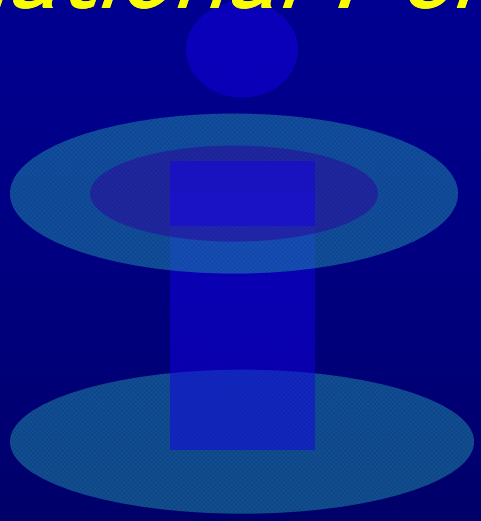
Care Robotics: Evolution of the Field from an International Perspective



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SIT

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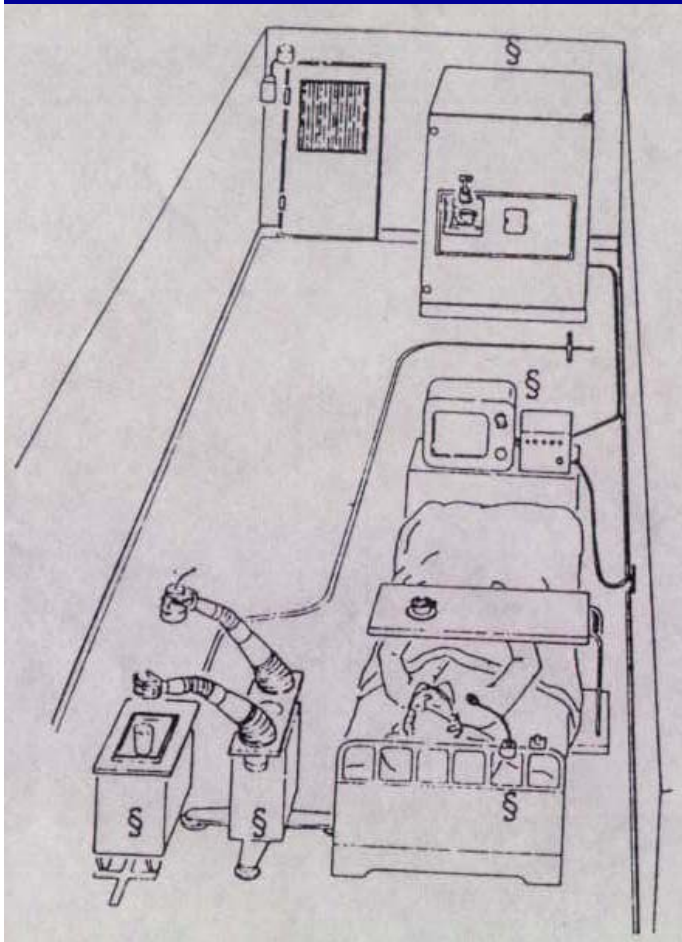
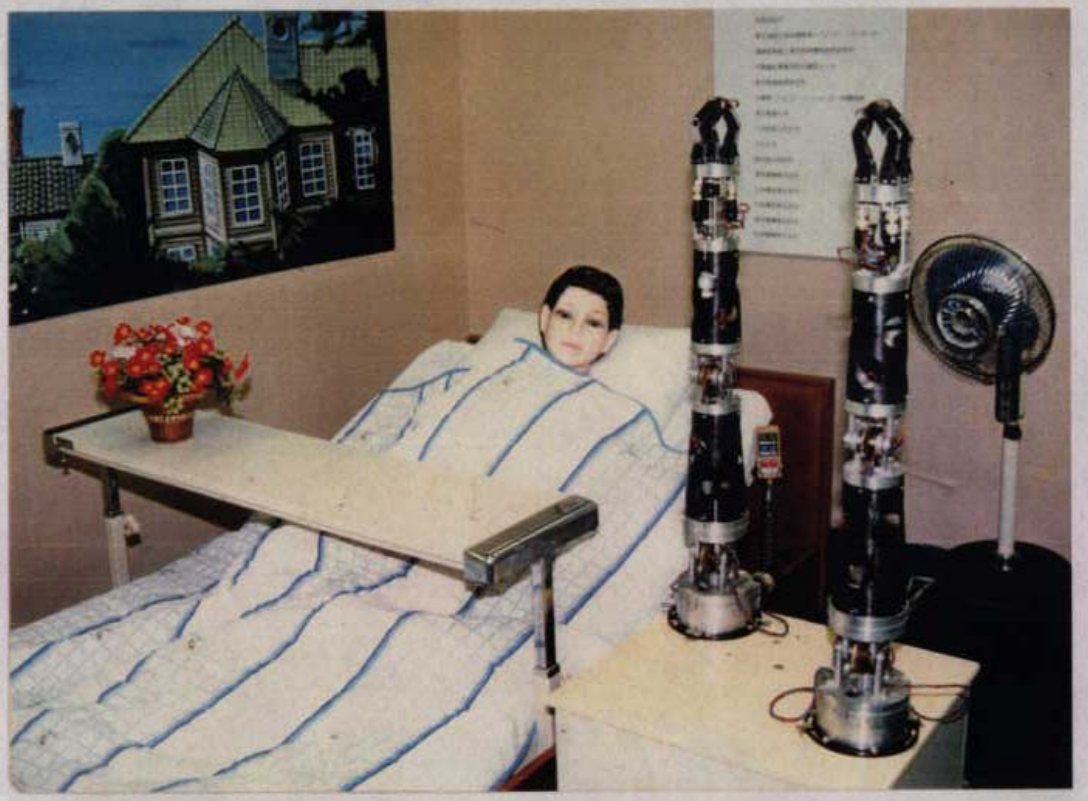
Robotic aid system for bed ridden patients

- First robotic aid system in the world
- Developed by prof.Funakubo in 1980
- Concept is important





Robotic Aid System for Bedridden Patients

VIDEO

Robotic Aid System for Bedridden Patients

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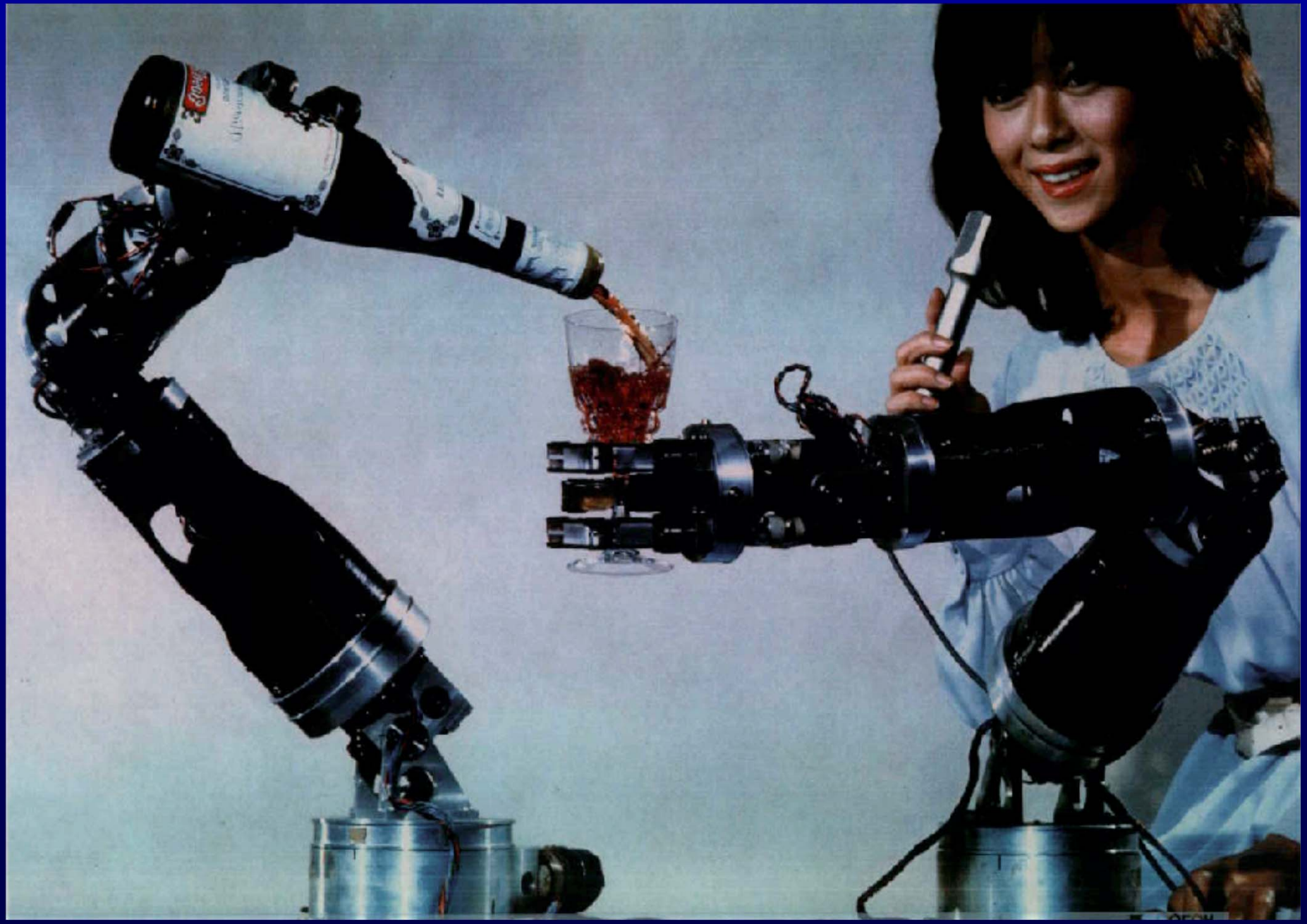
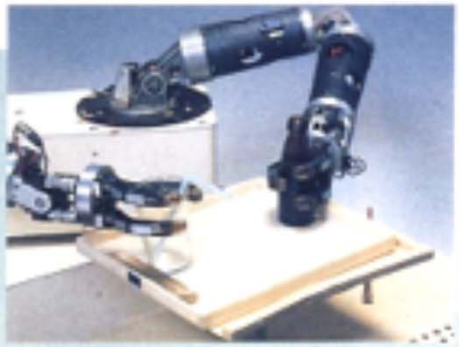
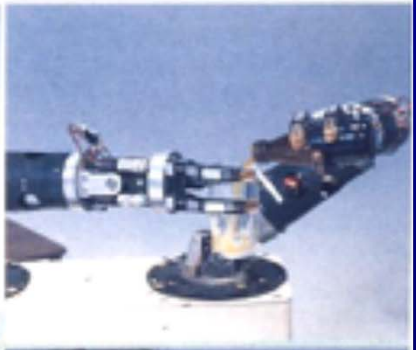
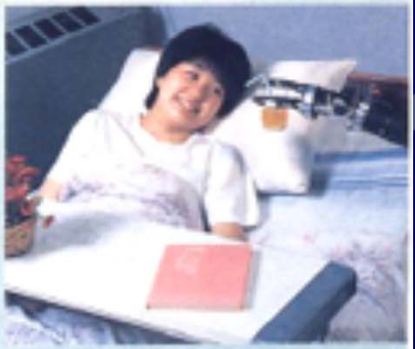


一対協調による搬送動作

④ 受話器の把持・搬送動作







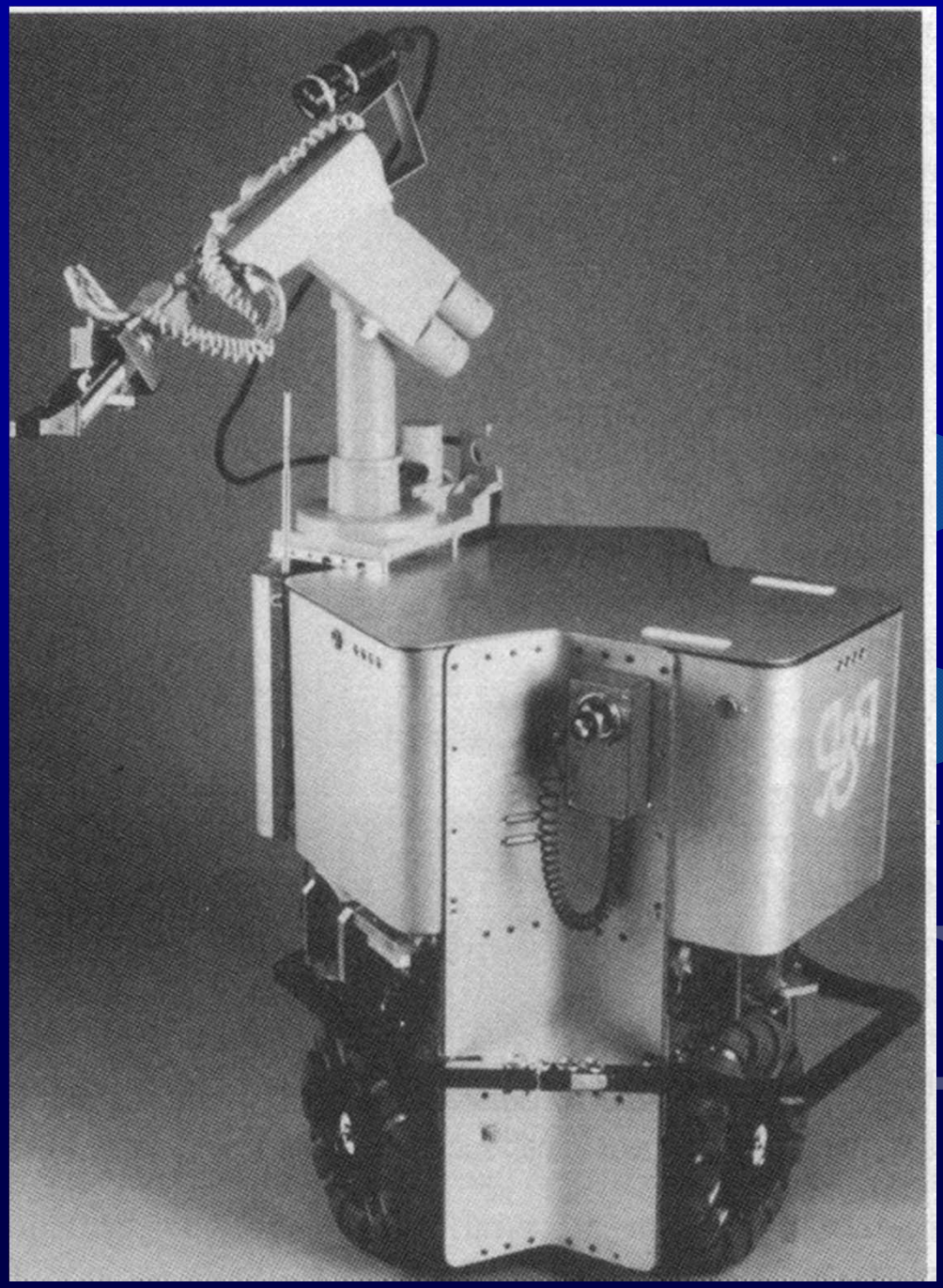
⑦ 一対協調による食事介護動作

Robotic aid System

- First robotic aid system in the world
- Basic concept is same as present systems

  manipulator, mobility, interface etc.

- Too big system
- High cost
- Human or robot



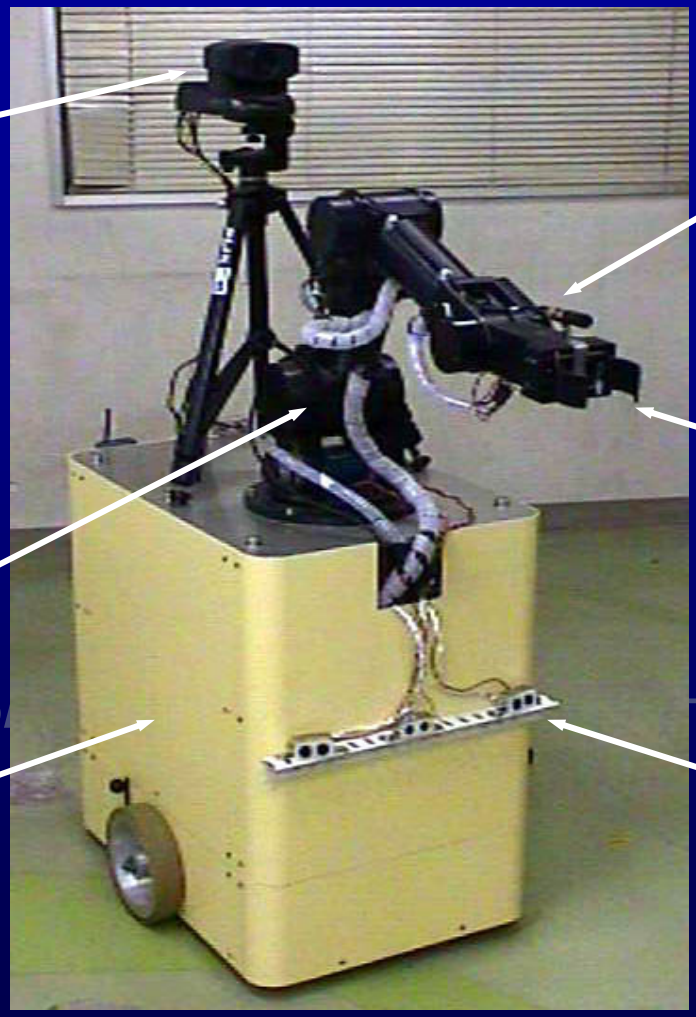
TECHNOLOGY

Mobile robot

Stanford Univ.

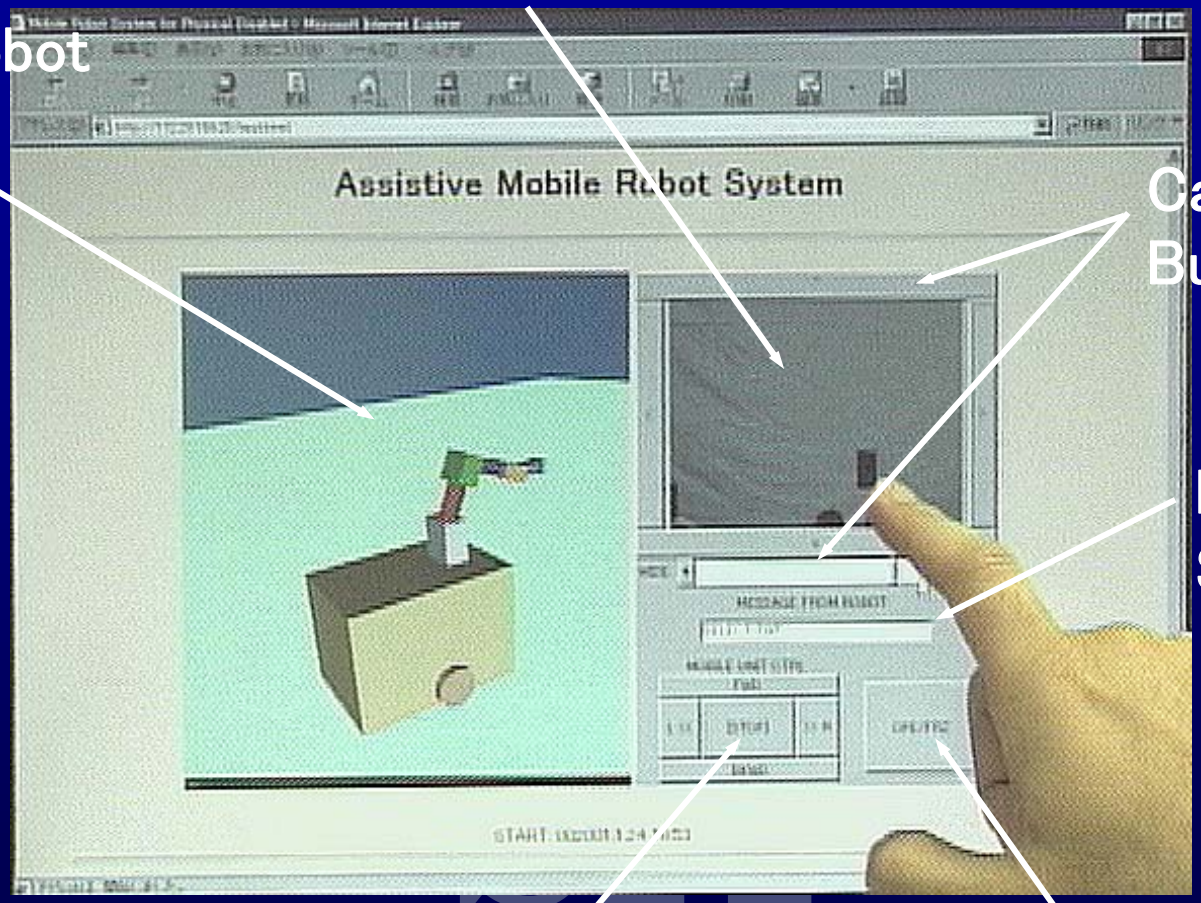
Prof. Leifer

Mobile Robot



Overview of the Mobile Robot

User Interface



3D Image of the Mobile Robot

Camera View

Camera Control Buttons

Mobile Robot Status

Mobile Unit Control Buttons

System Control Button

Image of the User Interface

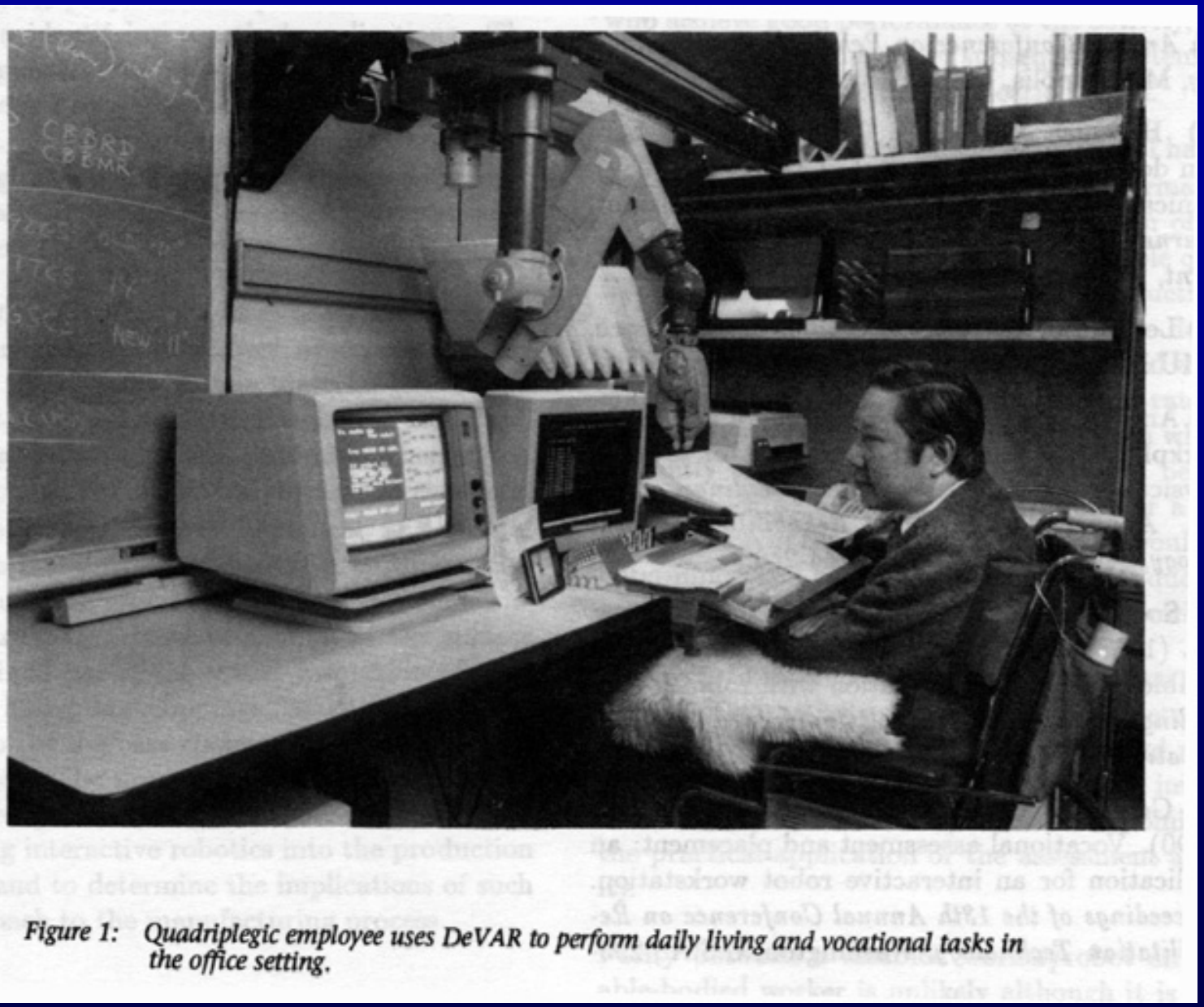
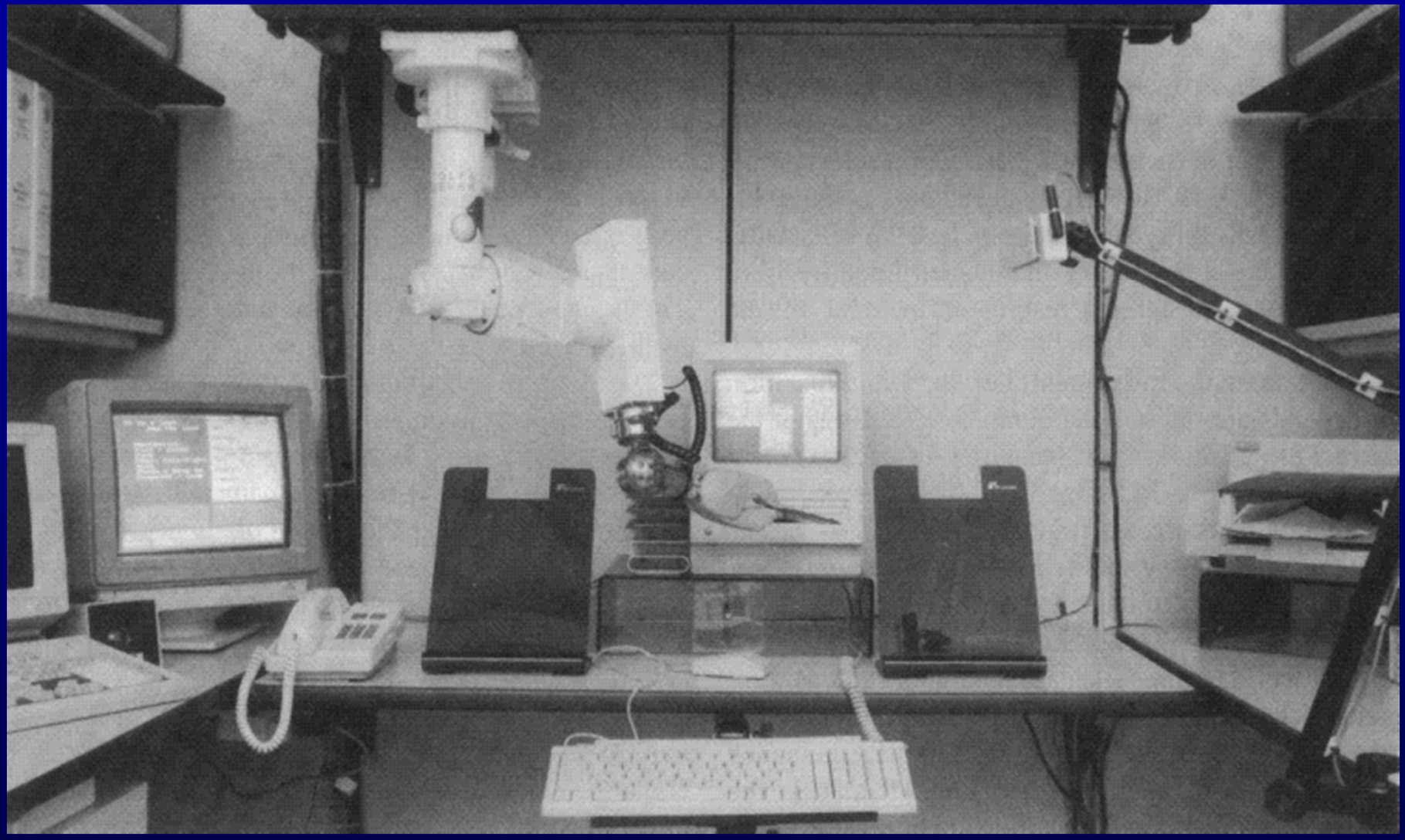


Figure 1: Quadriplegic employee uses DeVAR to perform daily living and vocational tasks in the office setting.



MANUS
Wheelchair Mounted Manipulator

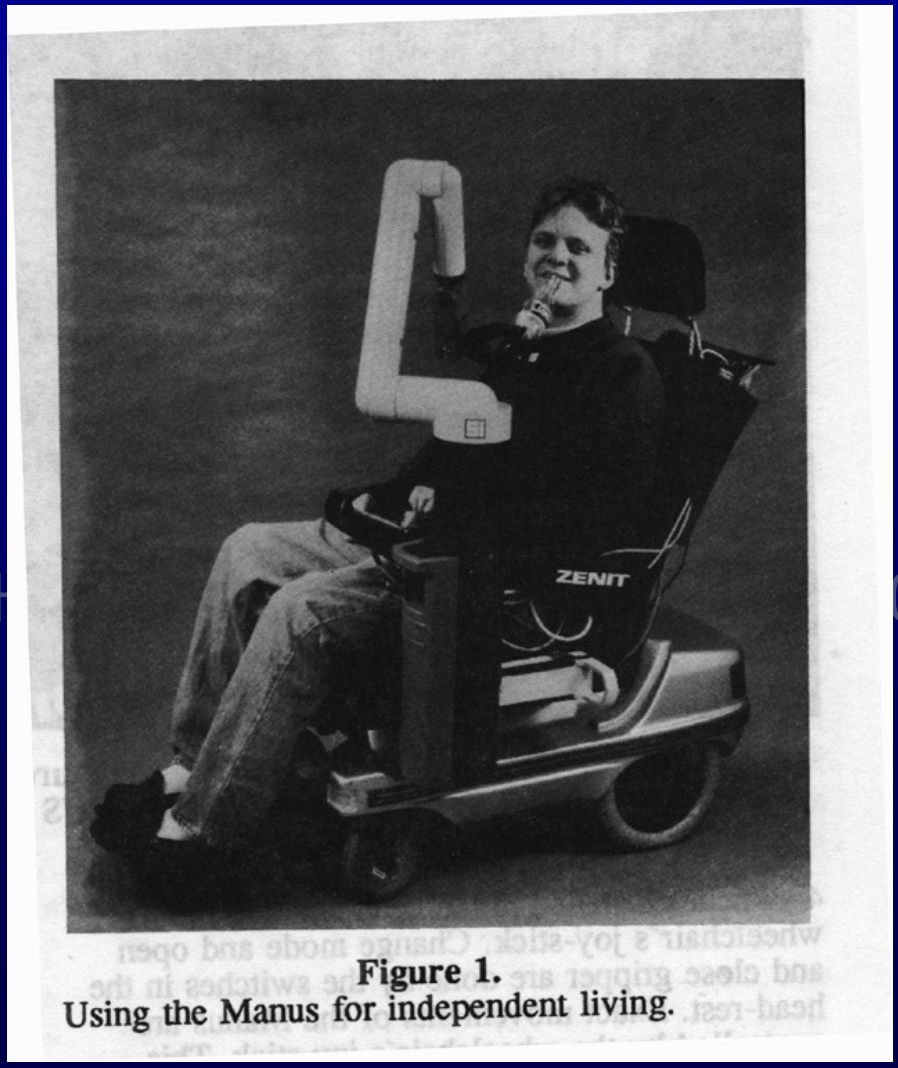


Figure 1.
Using the Manus for independent living.


Entwicklungsziele
Spannungsfeld
Dienstleistung

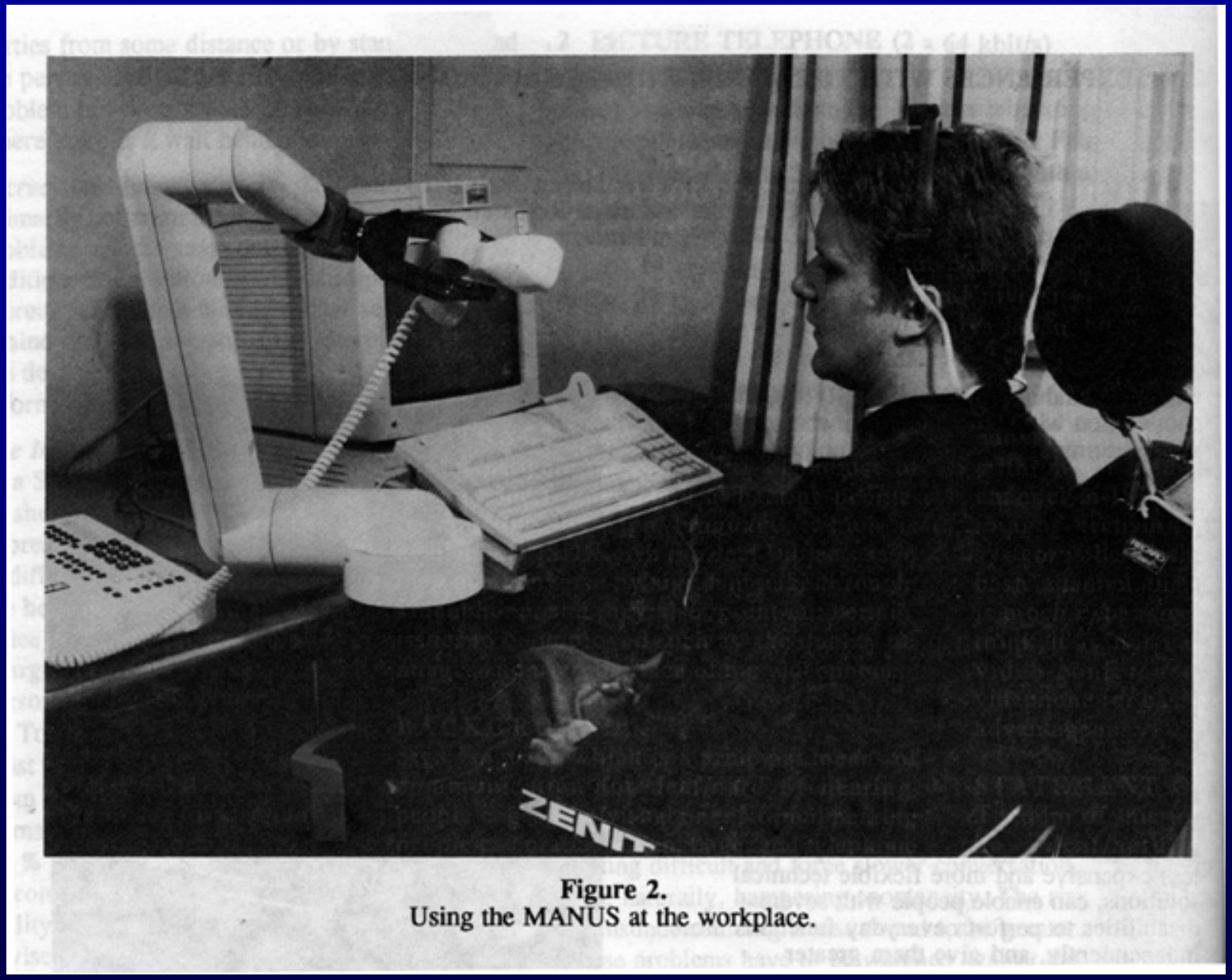


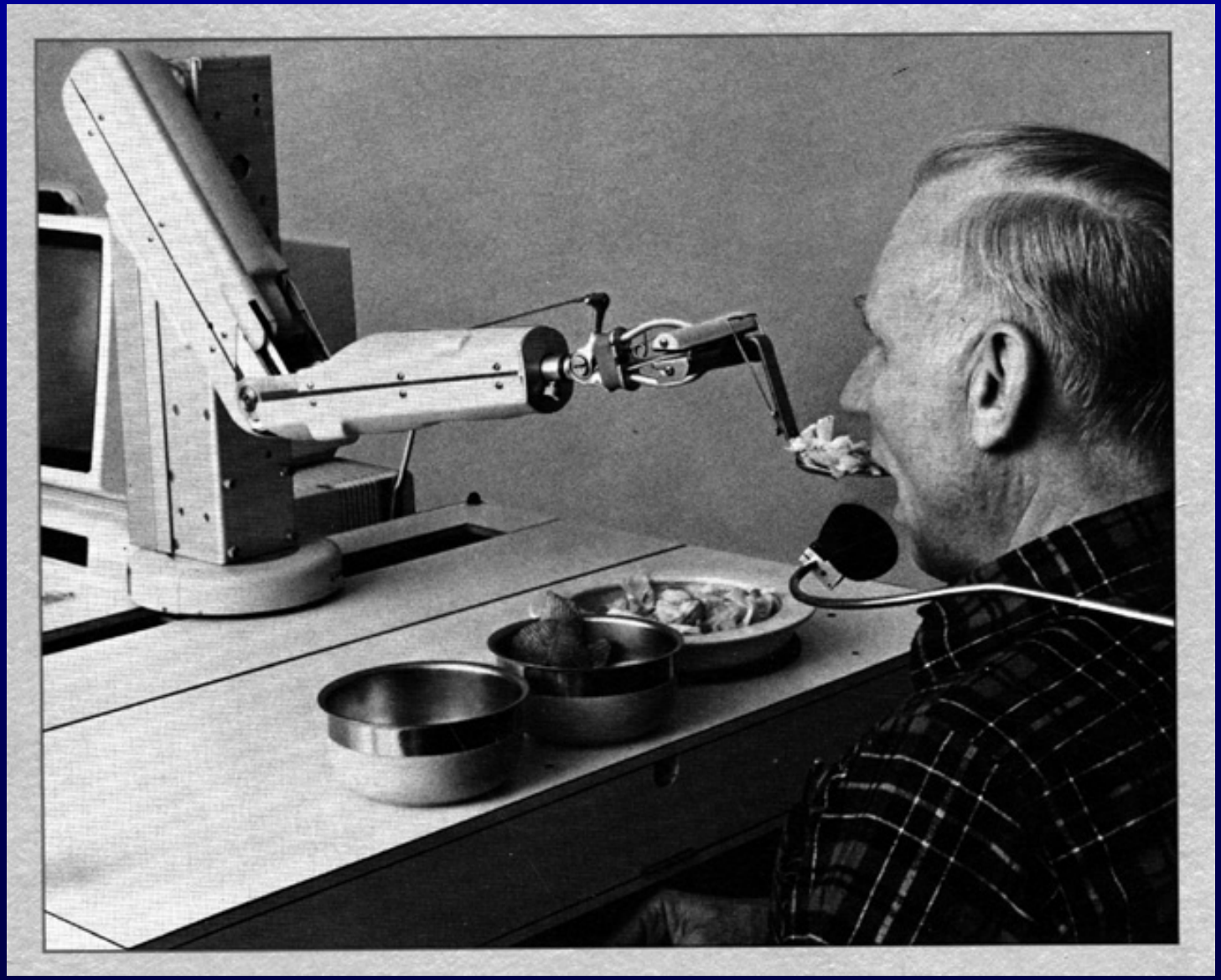
Figure 2.
Using the MANUS at the workplace.

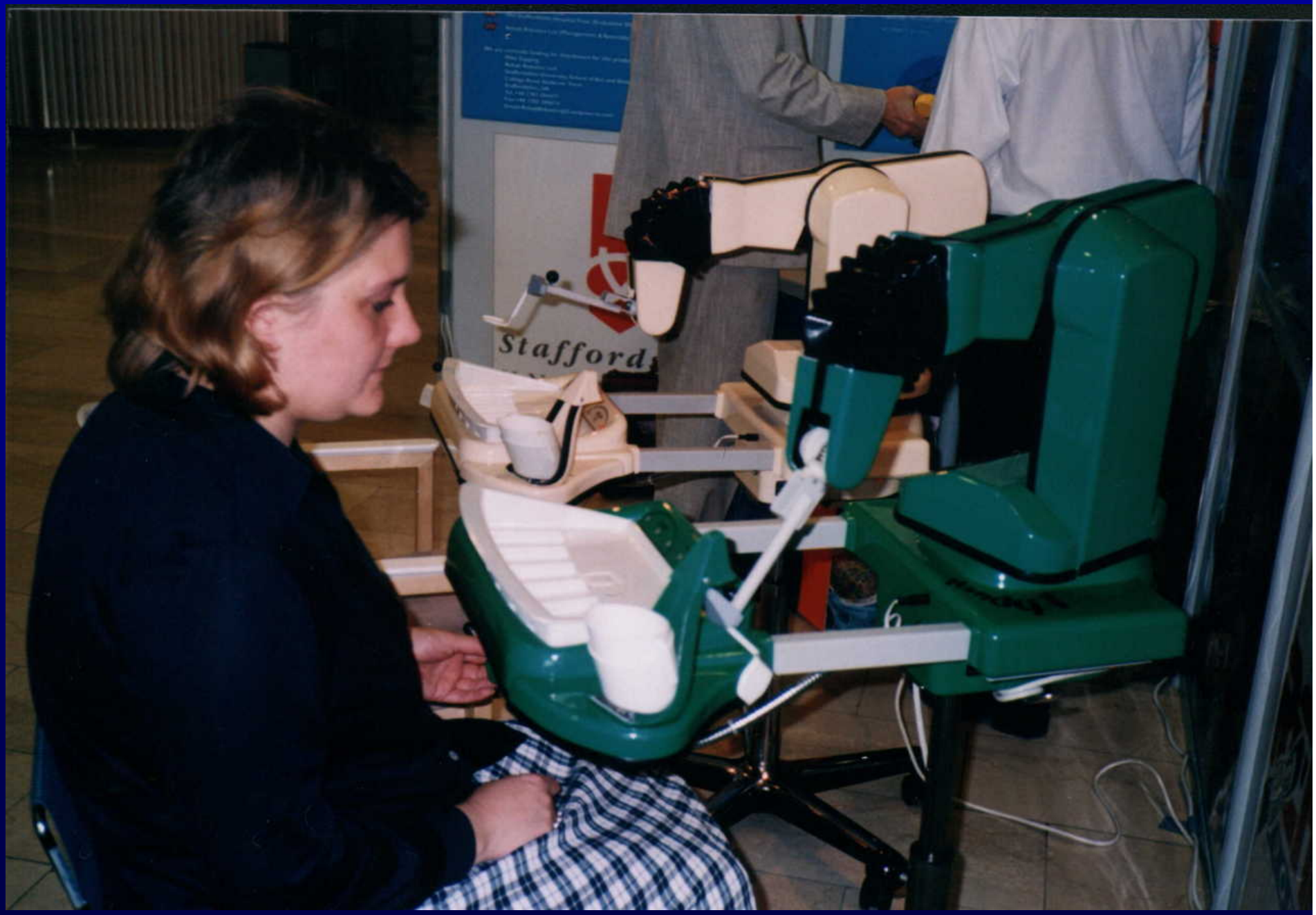
MANUS

MANUS
wheelchair mounted manipulator

- Beautiful mechanical design
- Small size & light weight
- High cost (4,000,000 Yen)
- Joystick interface is not good
- Needs new communication tool

Robotic aid for eating




Stafford

REHAB ROBOTICS

Handy 1™

AN
AID TO
INDEPENDENT
LIVING

REHAB ROBOTICS

Handy 1
Profile of a World Breakthrough

Handy 1 is the result of research created from the concern of one person with disability for another. Initially designed to meet the needs of private home use, this practical device is eminently suitable for any environment including home, schools, hospitals or private nursing homes.

The device itself is an integration of current low power robot and microprocessor technology, housed in an ergonomically convenient package designed for ease of maintenance.

Especially formed to bring this world beating development into everyday use, Rehab Robotics Ltd. have a fundamental commitment to build a better quality of life, through robotic technology, for severely disabled people.

Future Developments
Continuous developments are planned for Handy 1, with a future programme aimed at drinking and grooming aids as retrofittable options.

Why try to design an Automated Eating Aid?
Accidents and diseases cause thousands of people to depend on carers every year, leaving them with no alternative but a future of other people deciding for them what and when they eat.

Deprived of their choice of food and the pace at which they eat, they lose self confidence and often, the will to try for themselves.

Until now there has been no solution to these problems.
Attempts have been made in the past to develop a robotic unit, with little success, as they were fairly crude devices with poor control features. Limited to use with semi liquid foods at best, they could not be adapted to users individual requirements.

The World's First Robotic Aid to Eating, Handy 1
Developed by the award winning Computer Applications to Special Education (CASE) Unit at Keele University, HANDY 1 overcomes these problems and is the first commercially available Robotic Aid to Eating in the World.

Initial User Assessment - Preparation for use

Rehabilitation professionals assess a potential user, finding a suitable eating position, then setting the most clinically effective switch position.

Once identified, the user eating position is stored in the Handy 1 resident memory. All subsequent food presentations to this user will be consistently repeated. It has been shown that this can aid user progression towards independence.

Handy 1's Design makes food preparation an easy kitchen routine, absorbing no extra staff commitment. Everyday selections of food are arranged in up to several lines, with three "bite-sized" portions in each line.

Spoon Operation
The purpose designed spoon is mounted in a manner that allows a wide range of sitting positions. Due to its special shape, little wastage occurs in food collection and spillage is limited to a minimum during travel and lip closure. The spoon's design is contoured for eating comfort, and has been registered with the patent office.

Towards the development of other skills

Handy 1 presents the aspect of dignity in its ease of use, leading to a sense of self confidence, which in turn aids the process of self-motivation.

Benefits of using Handy 1
Being such a compact device, taking up no more space than a conventional hospital bed tray unit, Handy 1 is easily stored when not in use in home, care or work environments.

Skill Development
Because users must form their mouth correctly around the spoon, it must always be presented in a consistent manner. Robots are the only certain way in which this action can be repetitively guaranteed, making Handy 1 the ideal solution because, whilst consistently presenting food to the user, it does not feed them.

The Result
Choice of food, pace and quantity, so returning Dignity to eating.

Some users move to independent eating through the self confidence and skill training promoted by regular use of Handy 1.

Because Handy 1 does not feed the user, positive oral motor skills are encouraged and relaxed, positive practice is proven to help reduce unwanted reflexes.

Handy 1 is infinitely patient, reducing possible stress and tension from forced situations such as carer time restraint.

With the user in control of his or her own pace and choice, the conditions are set for encouraging independence with dignity.

COLOUR OPTIONS

Video

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HANDY1

- Robotic aid to eating
- Low price (5000 EUR)
- First practical application
- Not almighty

My Spoon

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The actual Care Robotics System

- One task robot was developed in practical use.
- Interface between human and robot is important.
- Hand and image processing is important factor.
- How to reduce the cost, mass production ?

What we expect to Care Robotics System ?