



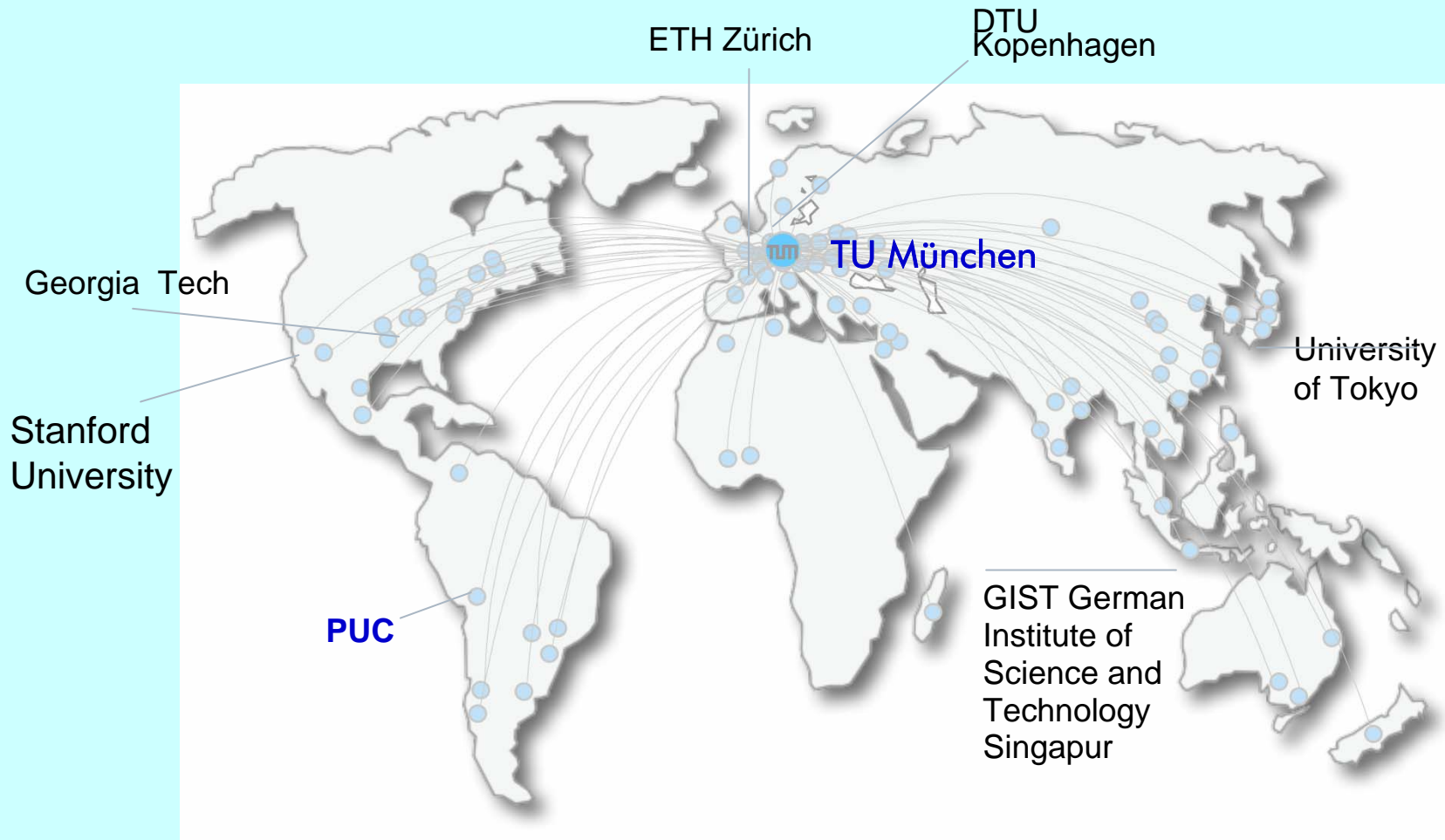
PONTIFICIA UNIVERSIDAD CATÓLICA DE CHILE



TECHNISCHE
UNIVERSITÄT
MÜNCHEN



Worldwide Cooperation Partners



Institut für Informationstechnik
Lehrstuhl für Prozeßrechner

BEITRÄGE ZUR ANWENDUNG MIKROPROGRAMMIERBARER
MEHRPROZESSORSYSTEME ZUR DIGITALEN SIMULATION
DYNAMISCHER SYSTEME

A L D O C I P R I A N O
geboren am 29. Januar 1950 in Santiago de Chile

Vollständiger Abdruck der von der Fakultät für Elektro-
technik der Technischen Universität München zur Erlangung des
akademischen Grades eines

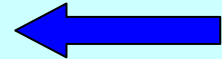
Doktor-Ingenieurs

genehmigte Dissertation.

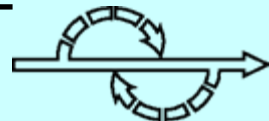
Vorsitzender: Prof. Dr.-Ing. H. Marko
1. Prüfer: Prof. Dr.-Ing. G. Färber
2. Prüfer: Prof. Dr.-Ing. G. Schmidt

Die Dissertation wurde am 30. Januar 1981 bei der Technischen
Universität München eingereicht und durch die Fakultät für
Elektrotechnik am 11. April 1981 angenommen.

Tag der Promotion: 16. April 1981



Personal Link between TUM - PUC

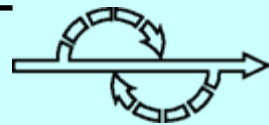






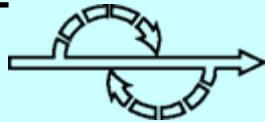
München: “Weltstadt mit Herz”

“The Cosmopolitan City with a Heart”



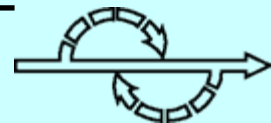


Technische Universität München TUM



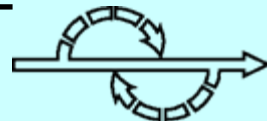


City Campus within the Museum Quarter



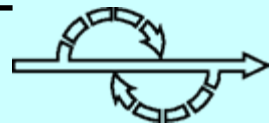
TUM – Some Numbers

- TUM established by **King Ludwig II of Bavaria** in 1868
- 14 Faculties
- 17 Collaborative Research Centres
- 22,000 students: 35% female, 20% international
- 9,000 staff members, including scientific and other staff
- 400 Professors
- 2600 Graduates: Diploma, Master, Double degrees
- 750 Doctor and Habilitation degrees
- Budget 0.8 billion €, 50% staff expenses
- Campuses: München, Garching, Weihenstephan/Freising



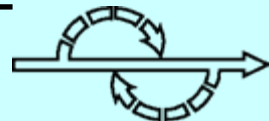


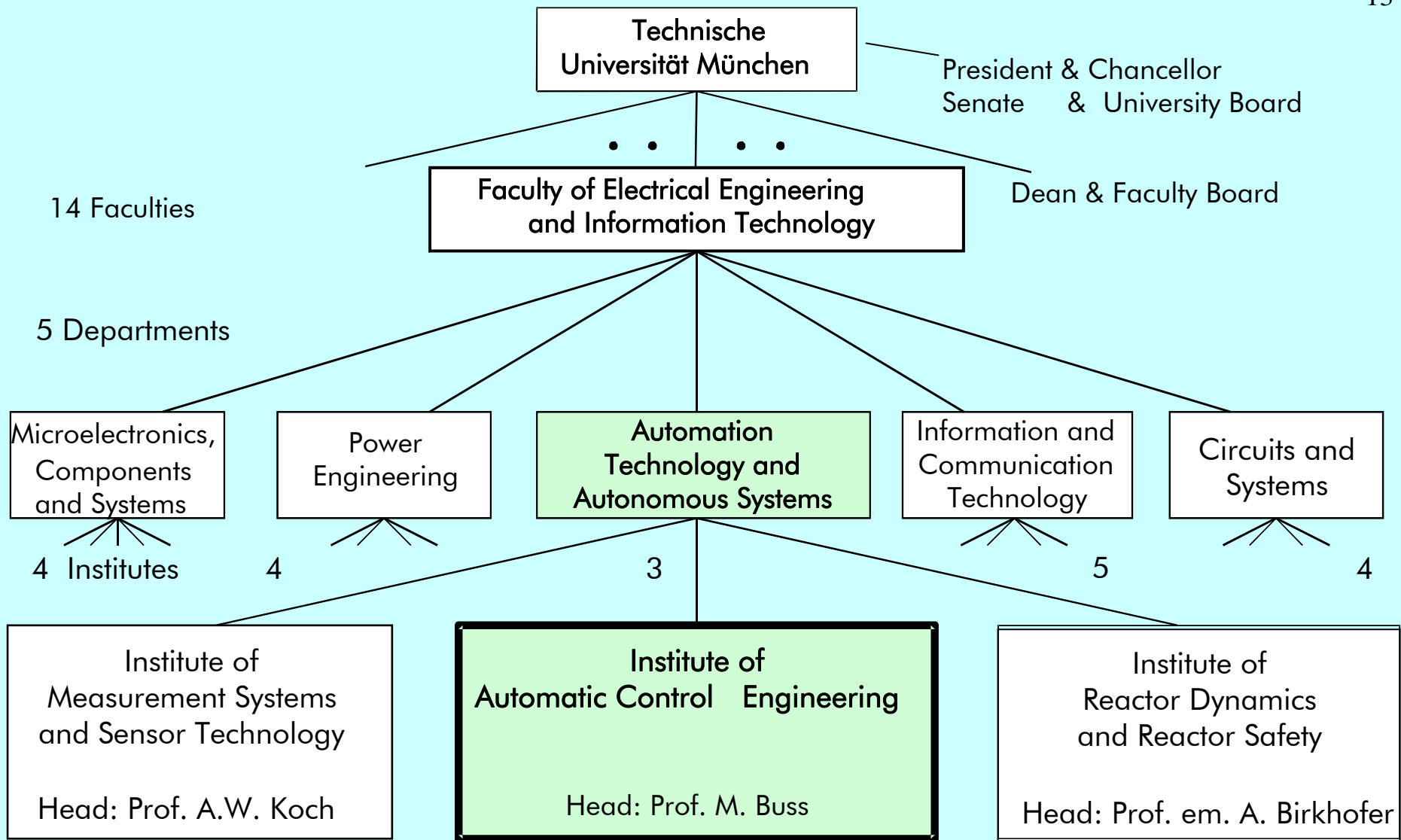
Neuschwanstein Castle



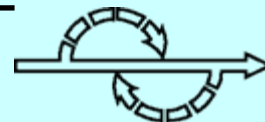
Faculties

1. Mathematics
2. Physics
3. Chemistry, Biology and Earth Sciences
4. Economics and Social Sciences
5. Civil Engineering and Surveying
6. Architecture
7. Mechanical Engineering
8. Electrical Engineering and Information Technology
9. Computer Science
10. Agriculture and Horticulture
11. Brewing, Food Technology and Dairy Science
12. Medicine
13. Sport Science
14. Forest Science



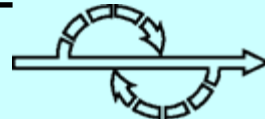


Organization



Faculty of Electrical Engineering and Information Technology 2007

- 2,000 students
- 750 1st year students, 50% international
- 250 graduates: Dipl.-Ing., M.Sc.
- 120 technical and other staff members
- 20 Full Professors and Institutes
17 Associate Professors
- 300 research/teaching assistants



Dr.-Ing.

Ph.D.

Semester

12

10

8

6

1

2

Dipl.-Ing.

26 Weeks

Diploma Exams

13 Weeks

Prediploma
Exams

13 Weeks

M.Sc.

26 Weeks

B.Sc.

10 Weeks

Prediploma Exams

Orientation Exams

13 Weeks

Ph.D.

M.Sc.

26 Weeks

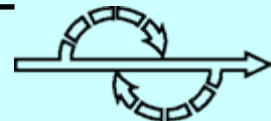
B.Sc.

- in **CE**
- or **MWE**

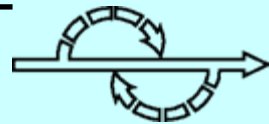
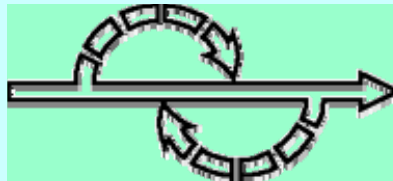
Bachelor Project

Diploma/ Master Thesis

Industrial Internship



Institute of Automatic Control Engineering



Head: Professor Martin Buss, Dr.-Ing. Univ. Tokyo

Associates: Professor Sandra Hirche, Dr.-Ing.
Information-oriented Control
Professor Olaf Stursberg, Dr.-Ing.
Industrial Automation Systems

Emeritus: Professor Günther Schmidt, Dr.-Ing. Dr.-Ing. h.c.
Interactive Systems and Control

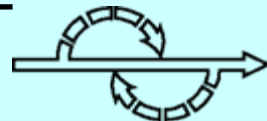
Scientific: 50 researchers and teaching assistants

Staff: 10

Visiting: 3

Educational Activities for students of

- Electrical Engineering and Information Technology
- Industrial Information Technology and Automation (Option)



Vision-Guided Robot Walking

*Visual Guidance, Step Planning and Adaptation,
Coordination of Perception and Locomotion*

*Autonomous Biped Walking
Using Stereo Vision and
Optimal Gaze Control*

Mobile Service Robotics

- *Task and Motion Planning,
Localisation, Navigation,
Multisensor Systems,
Human Robot Interface*
- *Robot Assistant for Tasks
in Health Care
and Private Homes*
- *Demonstrator Systems:*
 - ROMAN II
 - DIROKOL

Sensorimotor Systems, Neuroprosthetics

*Biokinetic Modelling and Simulation, Actuation of
Muscles by FES, Controller/Supervisor Design*

*Feedback Controlled Neuroprosthesis
for Standing Up/ Sitting Down,
Walking, Climbing Stairs*

Multi-modal HiFi Telepresence and Teleaction

- *Visual, Auditory, Olfactory;
Haptic: Kinesthetic and Tactile;
Real and Virtual Environments;
Rendering; Networking and
Internet Communication*
- *Applications: Tele-service,
Tele-inspection, Tele-experiments,
Tele-shopping, **Training** ...*

Interactive Systems and Controls

Advanced Topics in Control Theory

- *Modelling, Simulation, Controller Design,
State Reconstruction for Hybrid,
Discrete-Continuous Dynamic, Systems*
- *Control of Complex
Discrete Event
Processes*
- *Robust Control of
Nonlinear Holonomic
and Nonholonomic Systems*

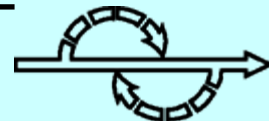
Applications:

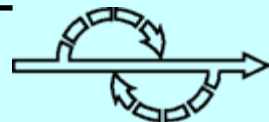
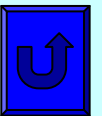
*Control of Flexible Assembly and Manufacturing Systems or Telephone Call Centers
Grasping with Dextrous Robotic Hands,*

Control of Underactuated Mechatronic Systems, e.g. SCARA Robot Arm, Vehicles





Recent Research Activities





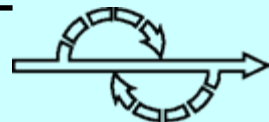
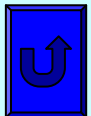
Welcome to Walk!

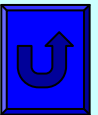
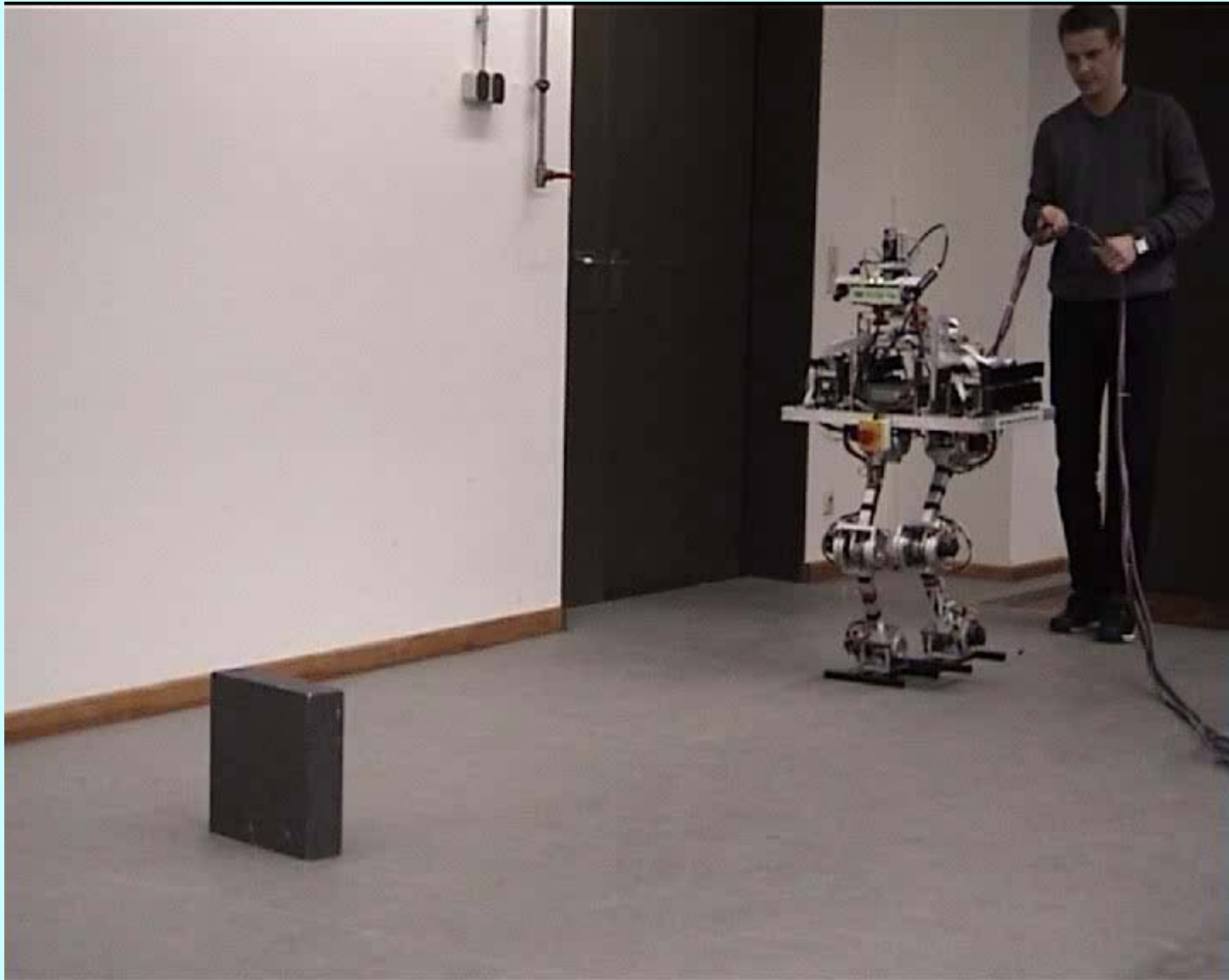
A Closed-loop Controlled
Neuroprosthesis
to Restore Ambulation



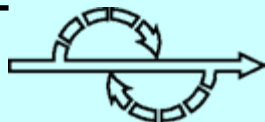
© 2000 Thomas Fuhr
Lehrstuhl f. Steuerungs- und Regelungstechnik
Technische Universität München

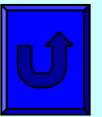
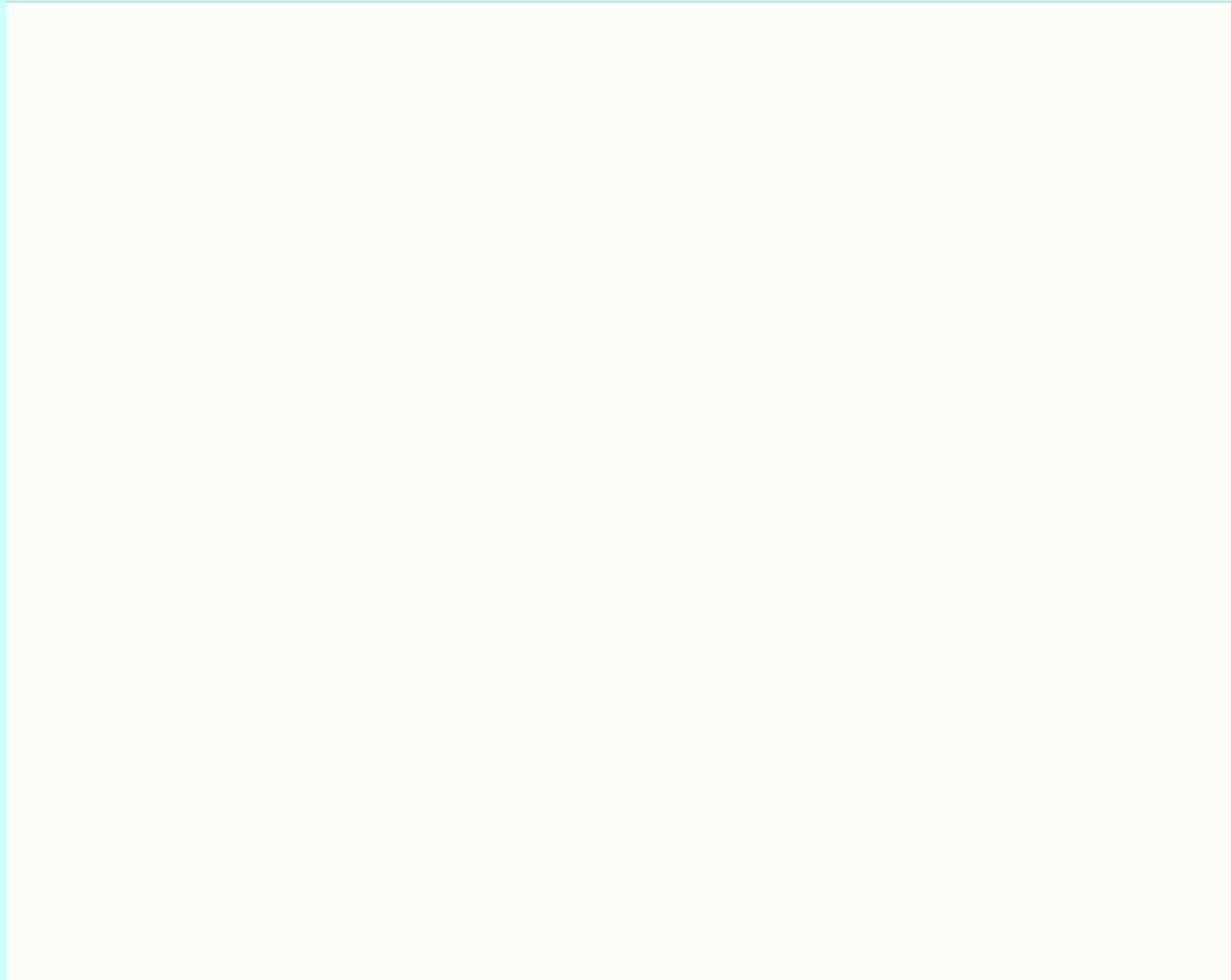
e-mail: thomas.fuhr@ei.tum.de



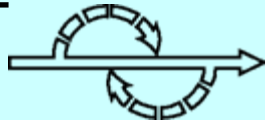


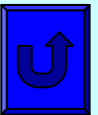
Stereo Vision Guided Robot Walking





Service Robot in Hospital Environment





Tele-shopping: Visual and Tactile Feedback

