



Vet-Trend - Transnational Meeting

Survey report on the communitary
learning system of Germany

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Introduction

- Good overview: www.E-Teaching.org - portal for the qualified education and training of university lectures (German)
- 15 German virtual/remote lab projects have been analysed
- Overview-table of project technology, m-Learning, domain target groups, existing experiment installations
- Short-living – funded pilot projects and pilot institutions - characterize today's mobile learning scenery
- The majority universities in Germany today offer e-learning or blended-learning options that are based on network Internet computers
- Most virtual and remote labs are operated by universities
- Only very few labs are online today

Overview

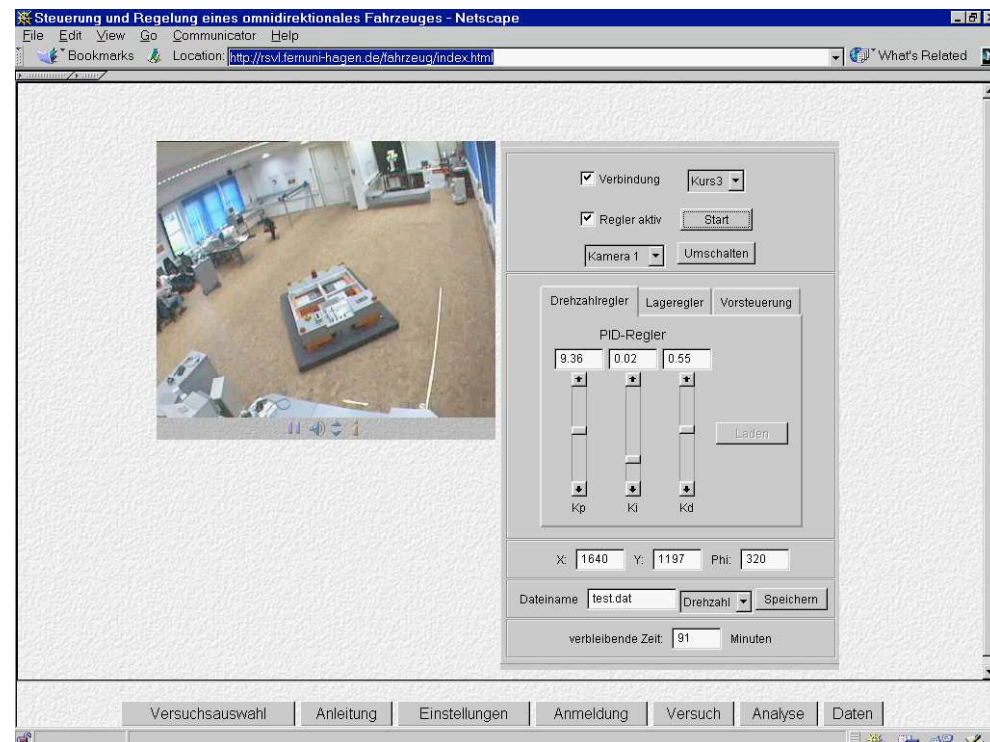
Project	Technology	m-Learning	Domain	Target groups	Experiments
VVL University Reutlingen	CAN, PLC, Java	No reports	automation engineering, computer science	Students, teachers, adult educators	PLC based control experiments
Virtual Lab Fernuni. Hagen	Robots, PLC, Java	No	control engineering	students	5 control experiments
Discourse Berlin/Potsdam Universities	Control experiments, .NET	Mobile clients	embedded systems programming, real-time programming	students	Lego Robots, Pendulum, Higher Striker
Marvel artecLab University Bremen	PLC,SCADA	No reports	engineering, mechatronics training	students	Solar plant
VirtLab	VipGen, Macromedia Shockwave, Apple QuickTime	No reports	molecular biology, genetic engineering	students,	Molecular biological processes, lab practice howtos
HECLA Hannover	UbiMotion, imc Lecturnity, RealMedia	Mobile Clients (PDA)	information systems	students, trainees	first year lectures,
tele-TASK HPI	tCube, Smarttech SMART Board RealMedia	Offline video for small devices	IT-system engineering, computer science	students, media, trainees	lectures, events
RCL University Kaiserslautern	Java, webcamXP, Webcam 2000, Java, PHP, ATMEL AVR	No	physics	pupils, teachers, trainees	Virtual hands on experiments

Overview

remote_lab Dt. Museum Munich	Web, Java	No	natural sciences	pupils	Virtual hands on experiments
Virtuelle Hochschule Bayern	Java	No	Robotics, adaptive control	students	6 robot experiments
IAS University of Stuttgart	Java, Chat, Blackboard	No	Real-time programming, concurrent programming	students	Railway
LectureLab Mannheim	Web, Java	Mobile Clients (PDA)	computer science	Students of computer and educational science	six experimental studies
ConcertStudeo Frauenhofer Darmstadt	Java, ConcertSuite	handheld devices (e.g. PDAs)		Students, teachers,	Lectures
Bär' Tool	No reports	No	computer science	Students	One experimental with 650 computer science students
Doering' Approach	Web, LcctComm, Tvremote, WLAN	handheld devices (e.g. palmtop computer and cellular phone)	communication studies, economics, information & computer science	students	experiments with three different lectures domains
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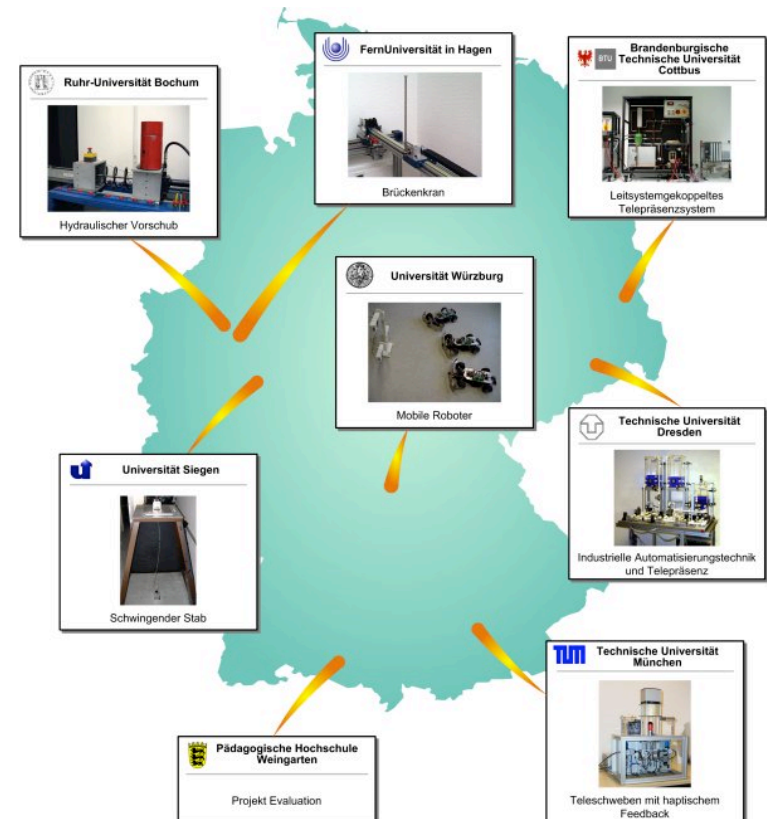
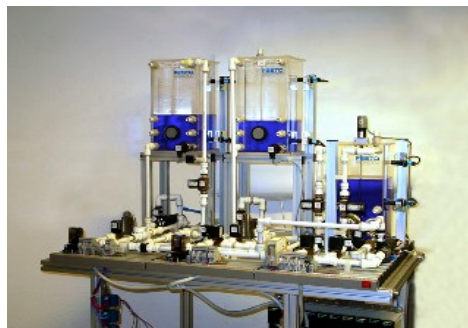
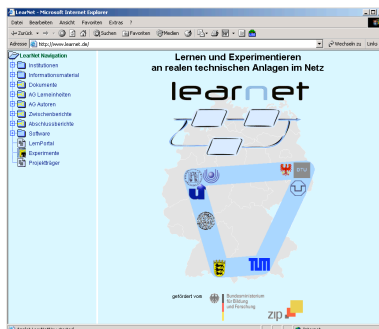
Virtual Lab at Fernuniversität Hagen

- Cooperation among three German universities (Bochum, Dortmund, Hagen)
- Several robot-based experiments
- PLC-based rail way control
- Ball balancer
- Feedback is provided by cameras using the Java Media Framework



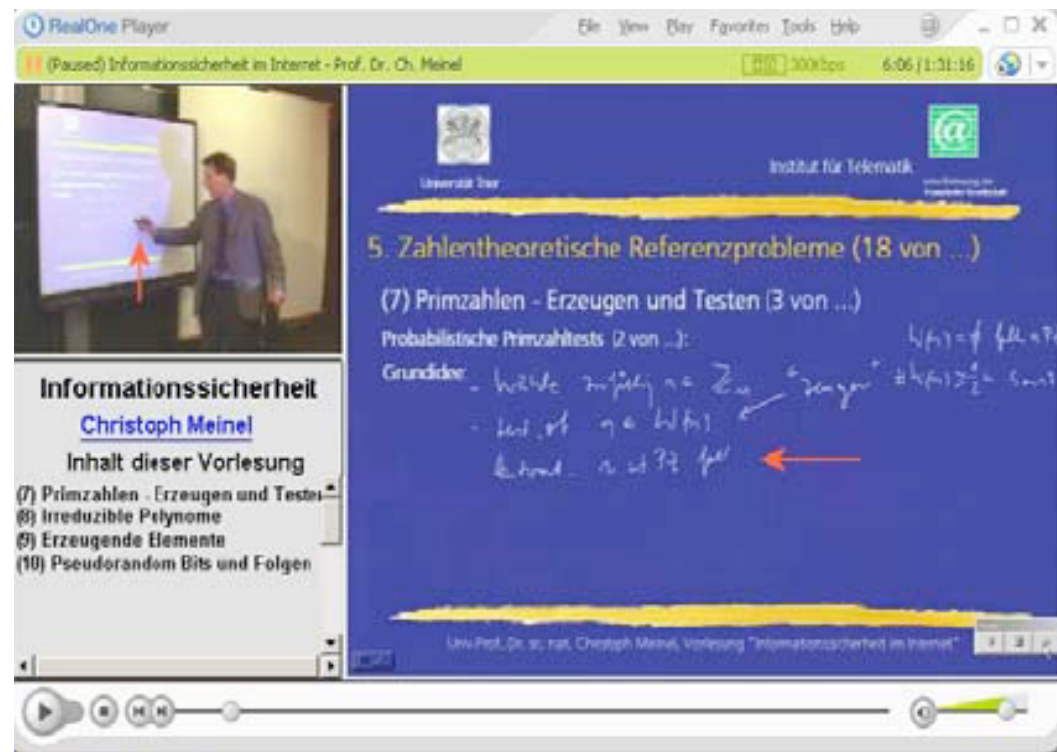
The LearNet Project

- “Lernen und Experimentieren an realen technischen Anlagen”
- 7 German universities sponsored by the BMBF
- One innovative experiment by each University in the field of control theory, automation and mechatronics
- Experiments developed:
 - Control of mobile robots
 - Inverted pendulum
 - Hydraulic engine
 - Other PLC-based experiments



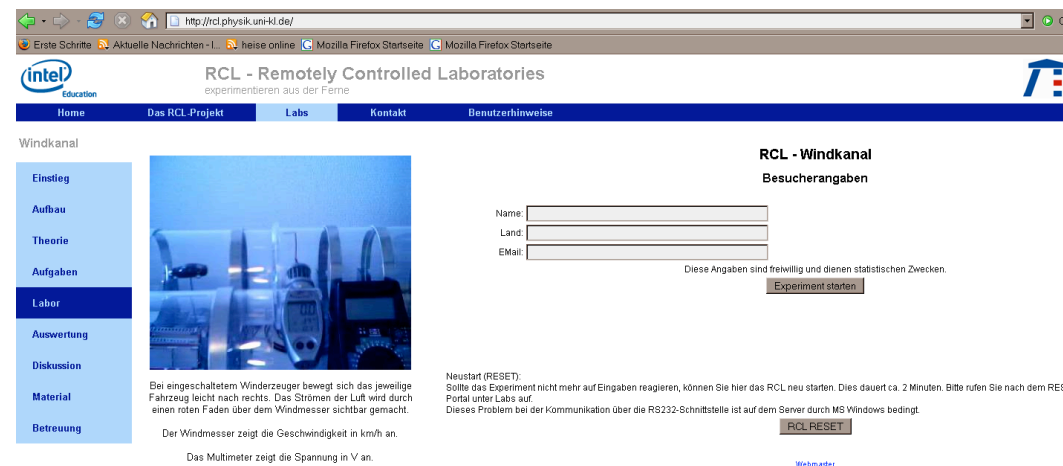
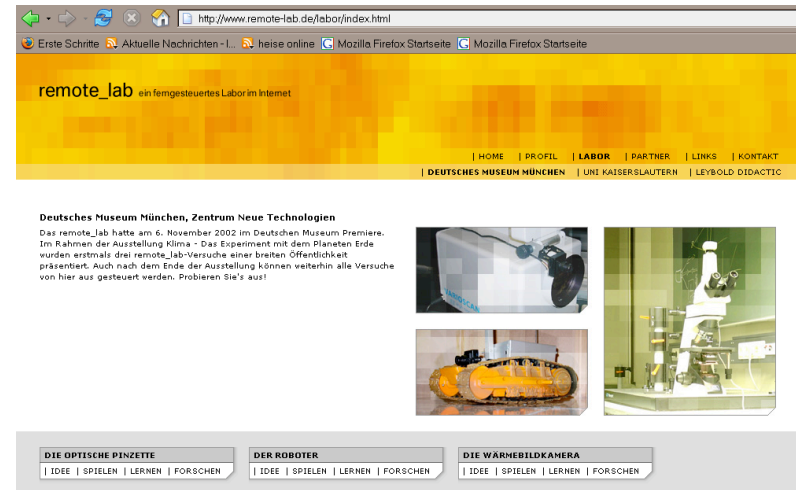
E-Learning in the Berlin/Potsdam Area

- Tele-Task system at HPI: Professional lecture recording system including Real-Media-Streams with video, audio, slides (+Podcast)
- DISCOURSE (DISTRIBUTED & COLLABORATIVE University Research & Study Environment) between HPI, TU Berlin, HU Berlin and FU Berlin
- The Distribute Control Lab at HPI
- Tele-Lab between HU Berlin and University of Illinois at Urbana-Champaign (Inverted Pendulum)



“remote_lab” at Deutsches Museum Munich

- Remote Lab Experiment for wide publicity
- <http://www.remote-lab.de>
- Cooperation with University of Kaiserslautern and LEYBOLD DIDACTIC
- sponsored by the BMW Stiftung
- OPTICAL TWEEZERS
- Capillary ROBOT
- “H2-Lab”



Conclusions

- Variety of projects in the field of e-learning and m-learning using remote and virtual laboratories in Germany
- Real experiments are settled at universities in the area of natural sciences, computer science and electrical/mechanical engineering
- Integration of real and virtual experiments into an LMS is not discussed often
- Integration of access to real and virtual experiments into existing blended learning environment (Moodle) using Web-pages (Java)