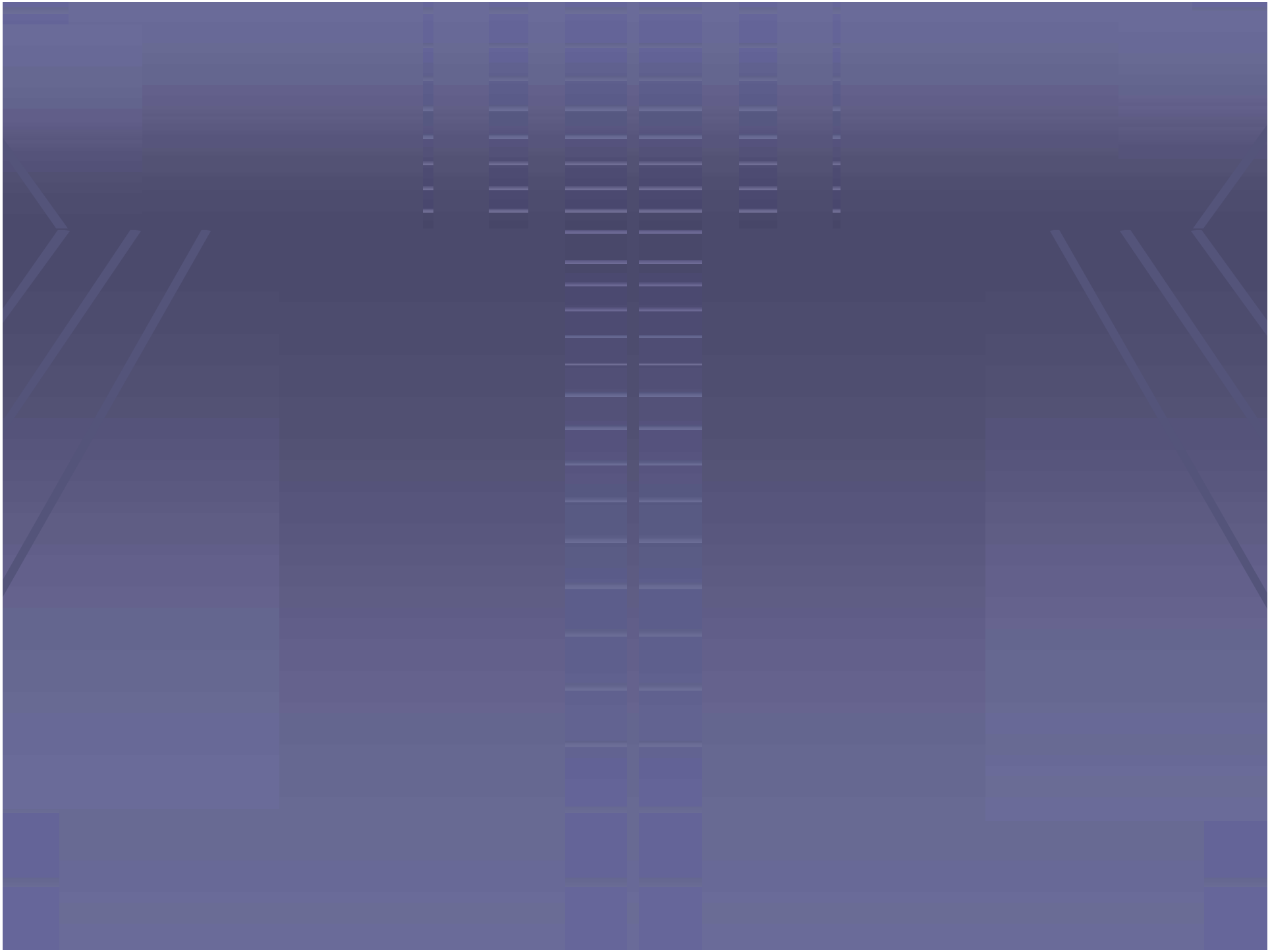

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Department of Control Systems and Instrumentation

# Inter-disciplinary projects in information systems teaching

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- Subjects connections and problems
- Information systems laboratory
- Software and hardware equipment
- Typical laboratory tasks
- Remote connection
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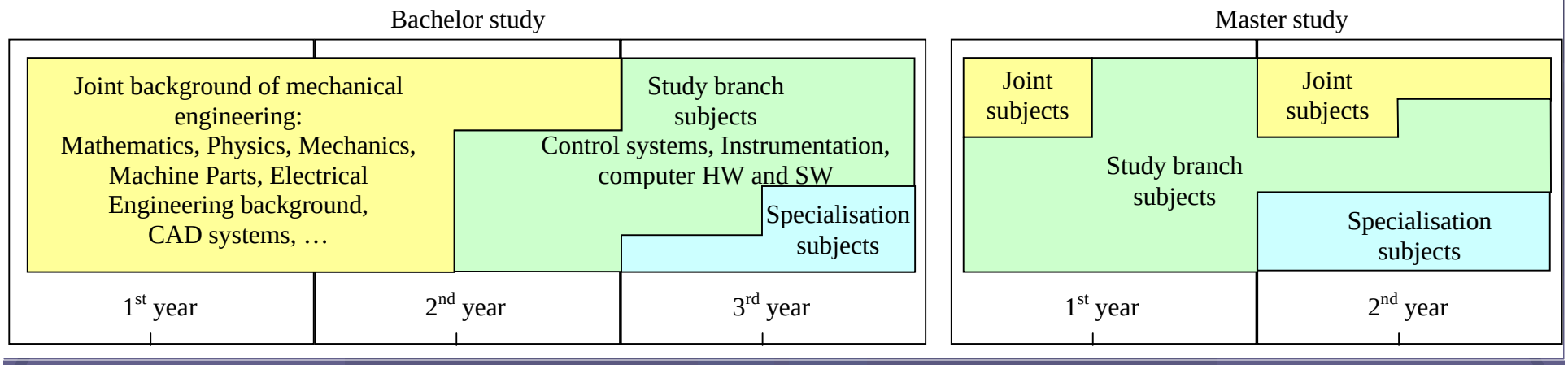
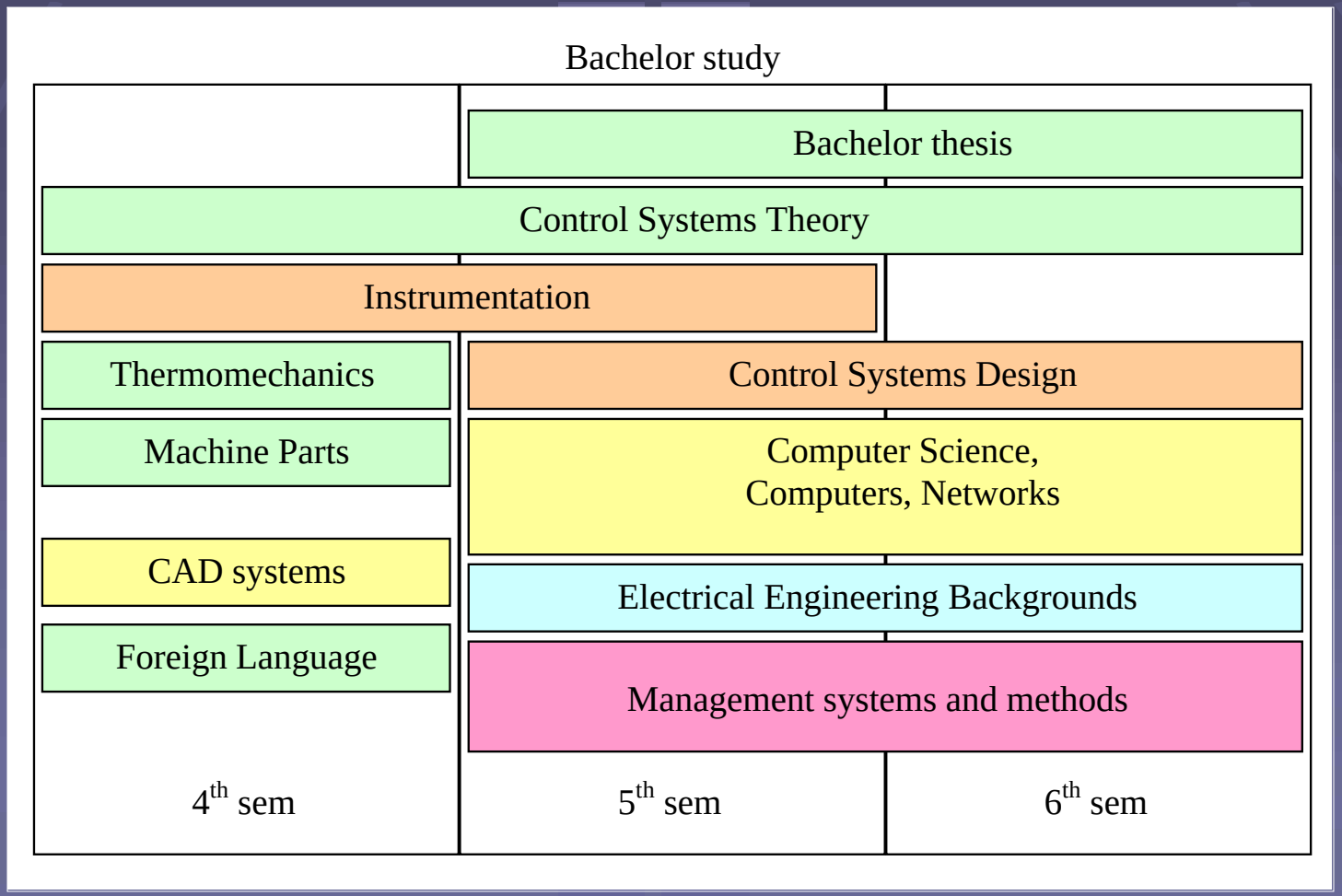
# Study plans




Main parts of actual study plans, changed to the serial study system, according to the Bologna Declaration, for study branch called ”*Engineering computer science and control* ” in the bachelor study plan, with three specialisations: *Control systems, Application of computer science* , *Technical management* .

# Study branch subjects



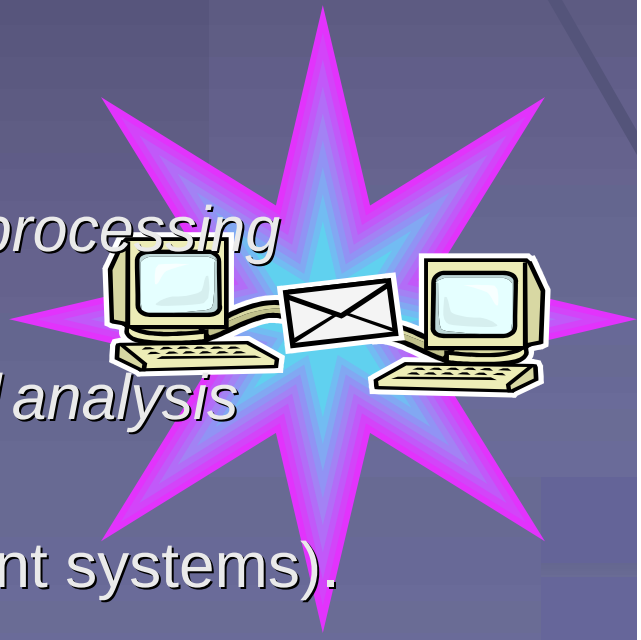
# Solved problems

- Separate study parts are guaranteed by different teacher groups as individual study parts without concurrence with other study parts
- Students have the problem to understand the problem connections between different fields of study
- Students have a huge problem to solve the complex problems throughout study specialisation, including development of software systems for concrete mechanical systems control
- These problems are much more significant for long-distance learning

# Subjects connections

As a first step to connect database problems with other parts of study, we found some problems taught in other subjects and included them in the exercises:

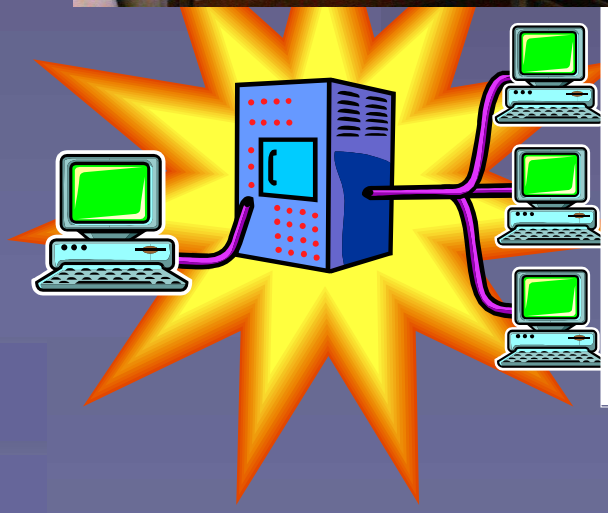
- *Measured data storing and processing* (Instrumentation, Sensor Systems).
- *Control system analysis and next data processing* (Control System Theory).
- *Technological process data storing and analysis* (Process Visualisation).
- *Production data analysis* (Management systems).



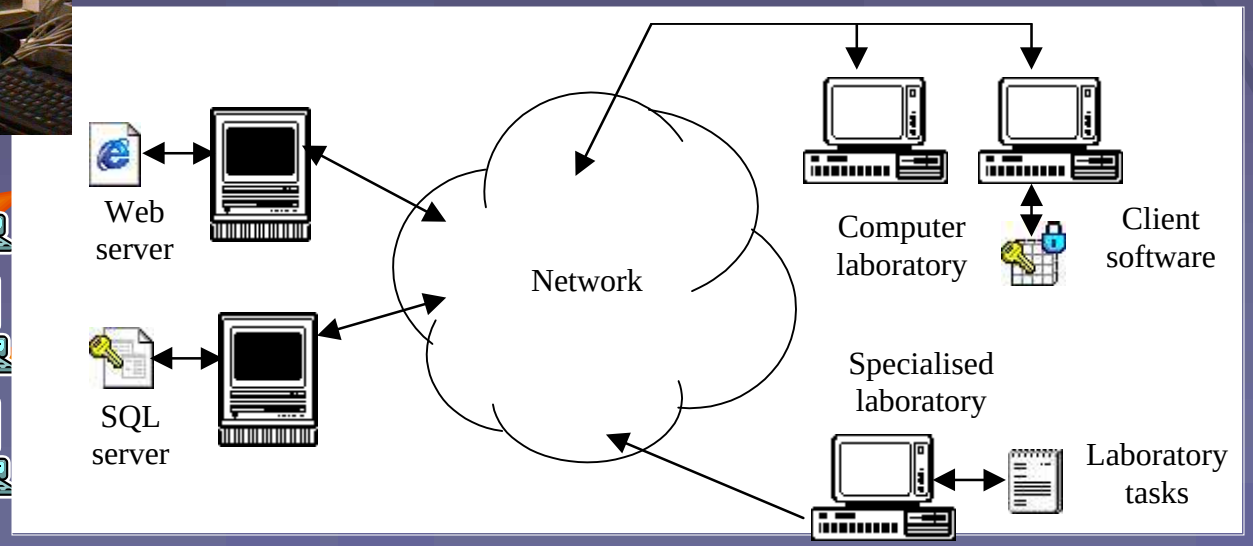
# Information systems laboratory

Main parts of new laboratory, connected with existing laboratory tasks located in specialized laboratories.

Server farm



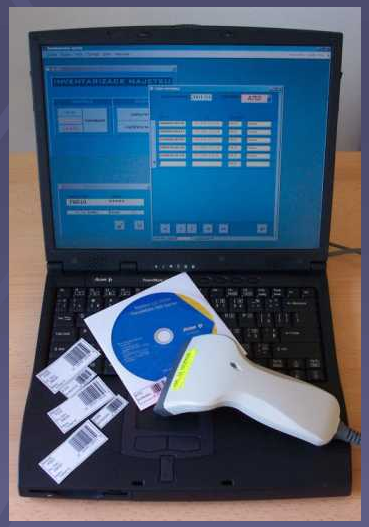
Computer connection



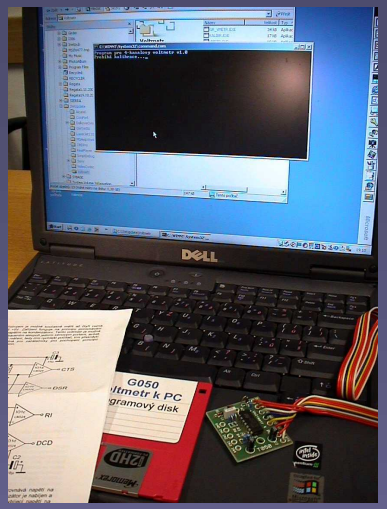
# Available software

- Database server (Microsoft SQL 2000 Server).
- Application server (web server with ASP technology support).
- Client program developing systems (PowerBuilder, Microsoft Access database).
- Data acquisition systems, measurement systems.
- Supervisory control systems, remote control systems.
- Control system developing software.

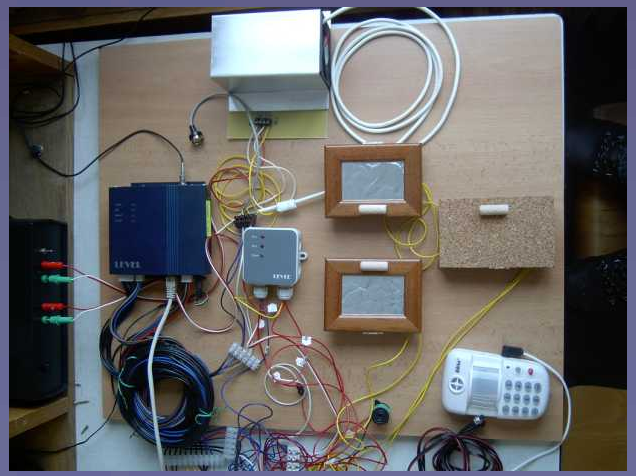
# Specialised equipment



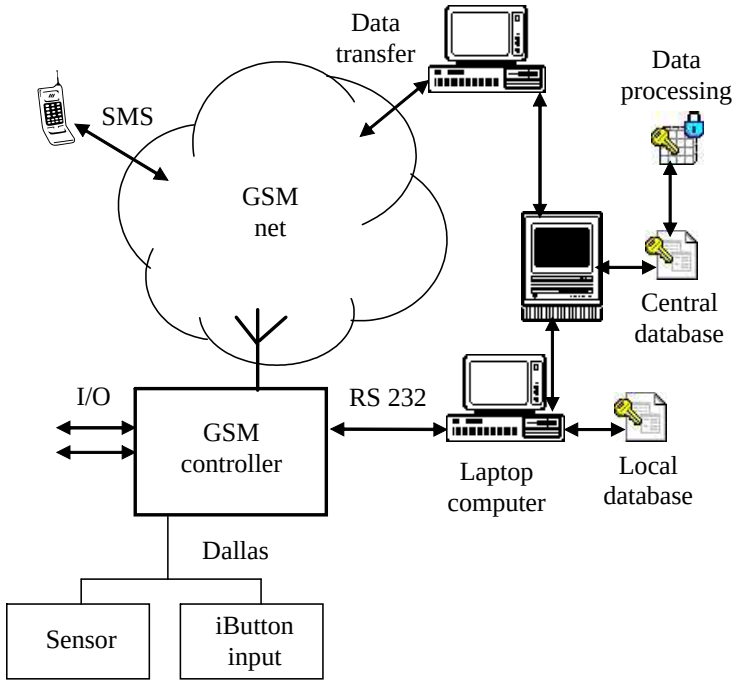
- **Bar code readers** – enables to develop typical warehouse and sales information systems with online data input



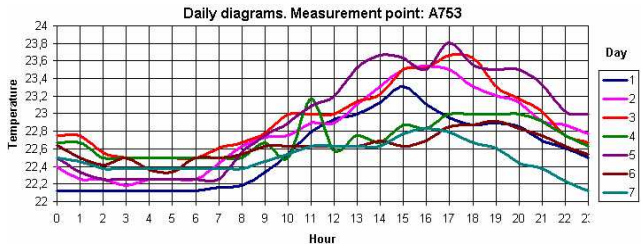
- **Simple input cards** - enables to develop data measurement and data processing systems,
- **Special GSM controller** - enables the development of simple measurement, data storing and remote control systems,
- **SCADA/HMI software** connected to the laboratory tasks for system visualization and control



# Typical laboratory task

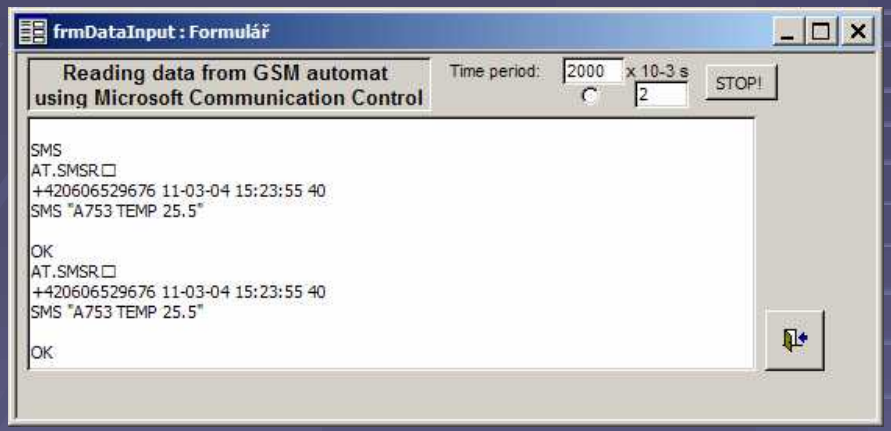



Security system based on GSM Controller

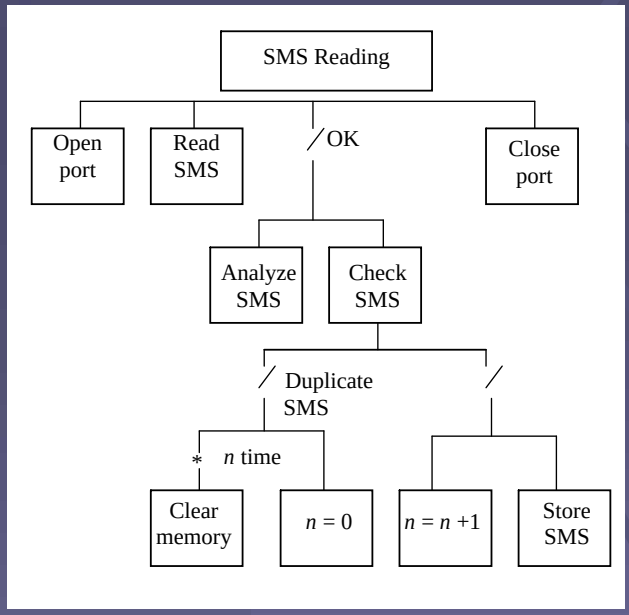


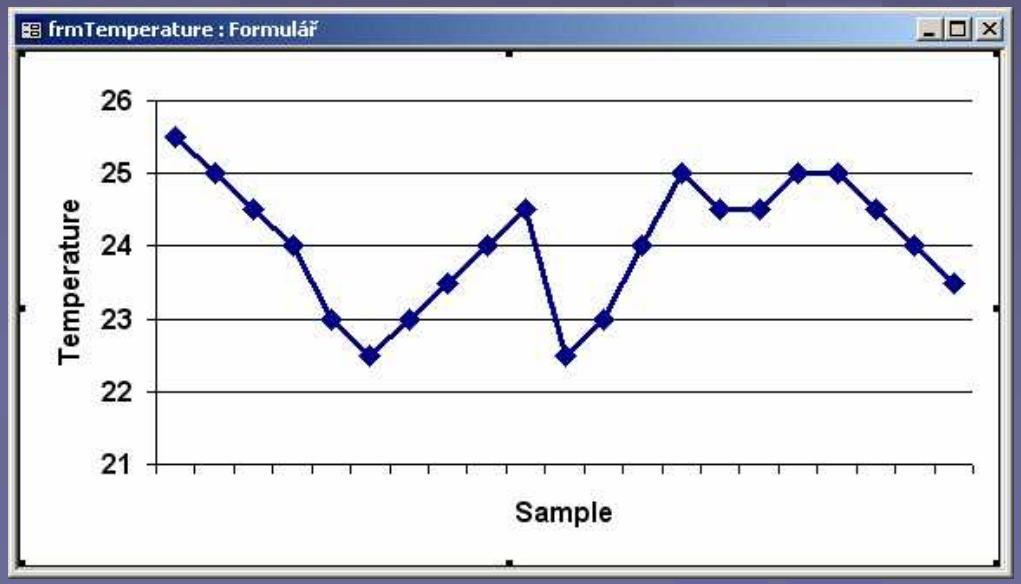

GSM controller is used as a data measurement system, which puts data in the database for further data processing and visualization

# SMS/GPRS connection



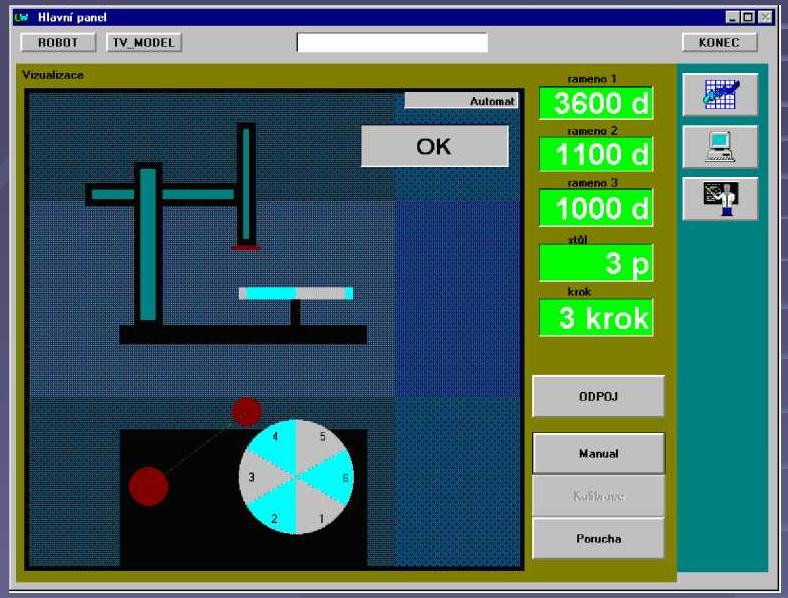

Data collection system

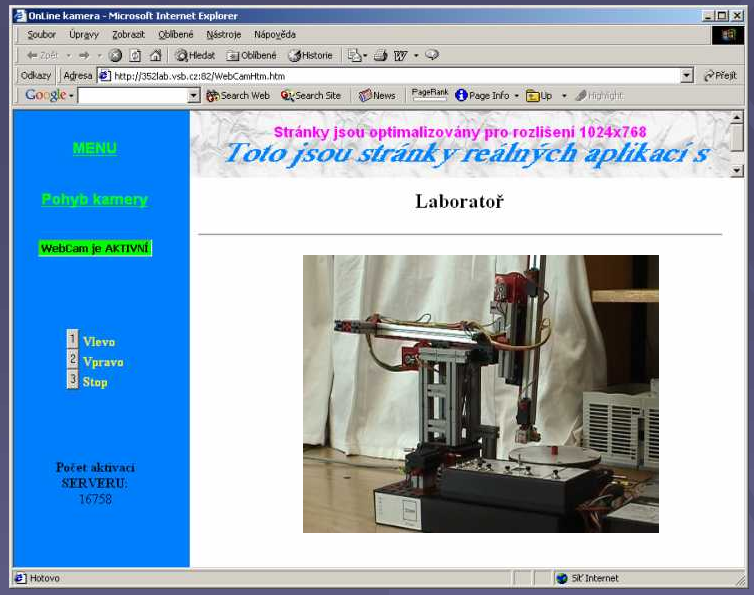


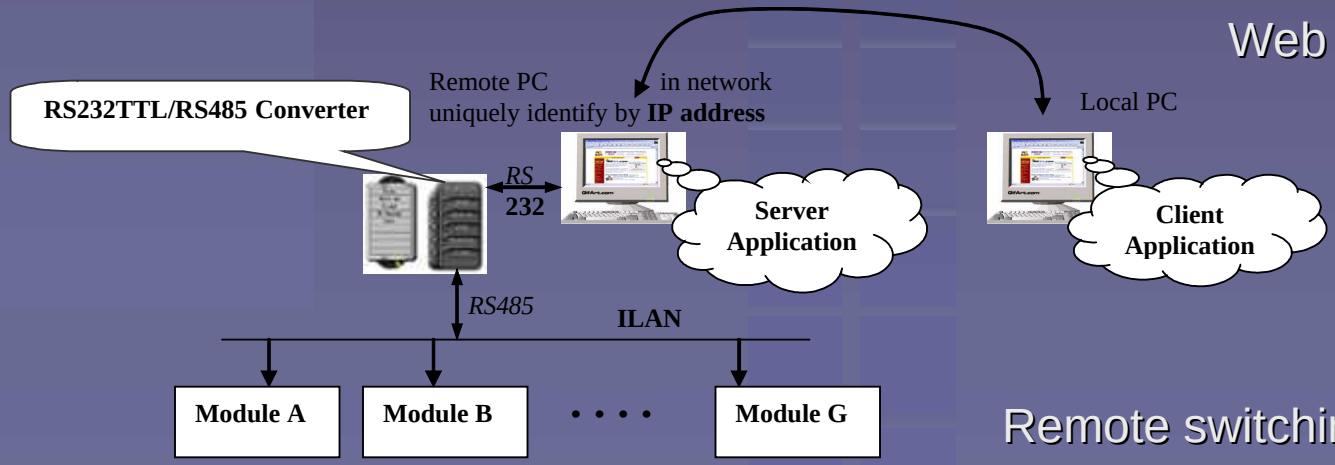

Data processing system

# SCADA/HMI Systems



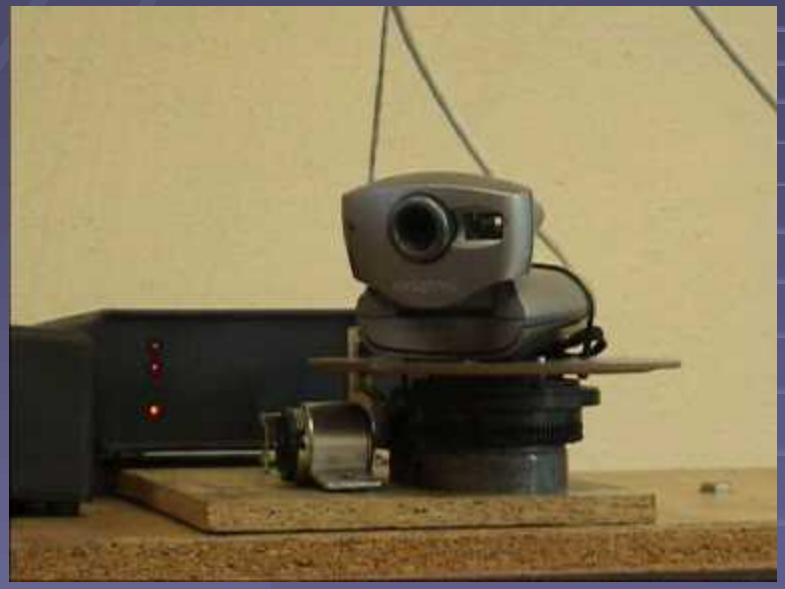




Web camera view

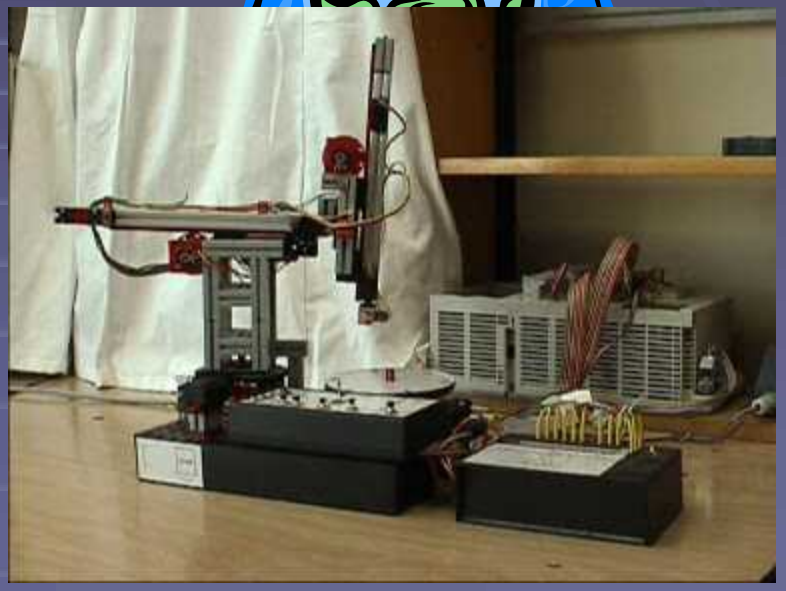



Remote switching module

# Web camera view



Web camera switched
and controlled via internet



Real laboratory task view

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# Virtual lab. connection


Presentation of Sensor and Measurement Laboratory


Web education pages for support of the Sensors and Measurement Laboratory

# Conclusions

We have now the first experience with solving these problems in the teaching process, and they have showed us that it is complicated to prepare suitable laboratory tasks. However, students are achieving good results and these problems are popular, especially among good students, because they can synthetize their knowledge from different courses


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The presented results have been obtained with the support of the Czech Ministry of Education, Youth and Sports, during completing of research project MSM 272300012.

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Thank you for your attention