

“Technological and pedagogical solutions for problem solving and troubleshooting are needed in the education of forestry machine mechanic”

The project is coordinated by North Karelia College, Valtimo and it is supported by National Board of Education, Ministry of Education, forestry machine colleges, forestry machine manufactures and elTRIO network. Technological research and development is operated at Tampere University of Technology at Hypermedia Laboratory and at Institute of Hydraulics and Automation.

■ Co-operation

- TUT / Hypermedia Laboratory
- TUT / Institute of Hydraulics and Automation
- eLearning Network – elTRIO
- North Karelia College, Valtimo
- Ponsse Oyj
- Komatsu Forest Oy
- John Deere Forestry Oy
- Witraktor CAT
- Parker Hannifin Corp

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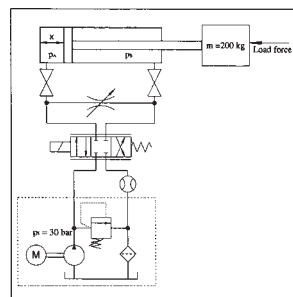
Virtual and intelligent learning environment
for forestry machine mechanic

COMPETENT MACHINE MECHANIC



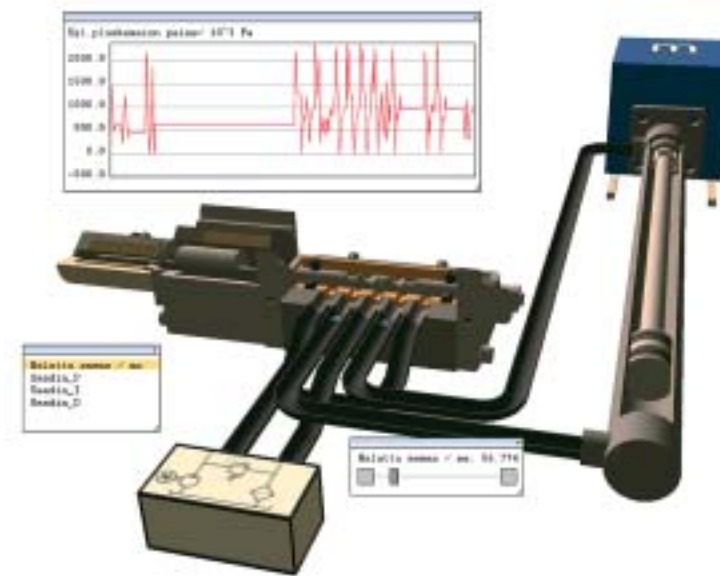
“See inside the moving machine. Limit, do an experiment, find a solution and be competent.”

The visualisation of the process in circuit diagram



Measurement

Artificial intelligence in fault diagnosis



3-D dynamic visualization of the system: real responses and parameters

Real-like faults in a vocational proficiency exam

The operating models of an experienced mechanic supports learning

Adaptive learning material via Internet



Intelligent tutoring system

Diagnostic systems of forest machines have been developed significantly during last years. Those systems are able to limit the failure into certain area, but the actual problem solving and the causality is far more difficult.

There is the significant need for the know how of a skillful mechanic.

It is possible to produce visualizations and simulations for the analysis of a hydraulic system. In addition it is possible to produce failure and problem cases, which can be seen in visualizations but also in circuit diagrams.

Tacit knowledge of an experienced mechanic is modelled for supporting problem solving.

Virtual and intelligent learning environment for training the forest machine mechanic

Description of project

The main objective of this project is to develop virtual and intelligent learning environment for vocational training of forestry machine mechanics. The learning environment will improve the effectiveness and quality of learning and an attractiveness of branch.

Challenges of education

The understanding of digital management, control and measurement system requires new kinds of diagnostic skills, measurement, troubleshooting and assembling. There are a lack of learning environments, instructional methods and training materials.

Virtual and intelligent learning environment

An instructor is able to do task description, plan the learning process, publish the task, guide, arrange debriefing and evaluate the result with help of the tools of virtual learning environment. It offers additionally support of fault diagnosis and inference, virtual measurement tools, and versatile interactive illustrations.

A learning process is supported by the operating models of an experienced operator, diverse illustrations and adaptive learning materials.