A Joint Master Program in Remote Engineering

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Within an EU funded SOCRATES project universities from Austria, Germany, Ireland, Romania and Slovenia develop a "Joint European Master Program Remote Engineering" (MARE).

The start of the project was at the end of 2004. Meanwhile more partners agreed to act as associated members in the consortium: the University of Technology Kharkiv (Ukraine), the Princess Sumaya University of Technology Amman (Jordan) and the Blekinge Institute of Technology Ronneby (Sweden).

Remote Engineering can be defined as combination of engineering and telematics, where specific engineering activities like programming, designing, controlling, measuring, sensoring, maintenance etc. are provided in an interactive manner over a distributed network (internet, intranet etc.). It is a special network technology with remote and virtual labs as a core. Also grid technologies are of high interest in Remote Engineering.

Remote Engineering (or more common Online Engineering) is one of the future directions for advanced teleworking/e-working environments especially in engineering and science (economics, informatics) but also in all other fields of society. In the last two – three years in Europe, a lot of projects and works in designing and developing remote and virtual labs were done. We can see the same trend overseas. This is related to the growing technical possibilities of the internet (bandwidth) and new models of e- and distance learning and e-work. The forerunners in this area are engineering disciplines and natural sciences.
Remote Engineering and Virtual Instrumentation are very future trends in engineering and science.
Due to the:

- growing complexity of engineering tasks,
- more and more specialized and expensive equipment as well as software tools and simulators,
- necessary use of expensive equipment and software tools/simulators in short time projects,
- application of high tech equipment also in SMEs,
- need of highly qualified staff to control new equipment,
- demands of globalisation and division of labour

it is increasingly necessary to allow and organize a shared use of equipment, but also specialized software as for example simulators.
Active learning or working by means of online laboratories is especially valuable for distance working or education. Users in the workplace can access the labs without travelling. This flexibility is important for teleworking, education and life long learning. Using online

laboratories has the potential of removing the obstacles of cost, time-inefficient use of facilities, inadequate technical support and limited access to laboratories. This kind of development leads to the seamless integration of work and learning (embedded learning).
This also would benefit people with special needs and people working from their home, as they would not need to travel to their companies' facilities to perform their work. Even employees working at their company's facilities can use remote specialized equipment at another affiliation or company without travelling. This may provide new opportunities and benefit for SMEs that would not be able to use such equipment otherwise.

But all over the world there is a lack of specialists in this field and the number of needed specialists will dramatically increase in the next years.

The master study program promotes:

- Basics, applications and experience in Remote Engineering
- Design and application of virtual and remote working environments
- Advanced teleworking solutions like online labs
- Remote Technologies for complexe engineering tasks
- Use of hard- und software and simulators in networks
- New ways for SME to apply high-tech equipment

The master study program gives the opportunity:

- To use equipment, software tools distributed in the Internet or company intranet
- To organize, implement, serve and maintain remote solutions
- To participate activly in the labor process for people with special needs

The multidisciplinary structure of the project comes out due to the different competencies of the participants concerning remote engineering technology and enhanced learning which accompanies the collaboration of different countries.

The first pilot course in "Remote Engineering" was started in November 2005 in Villach, Austria.

The next course will start in October 2006.

Further details at: www.mare-project.org