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Paper

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Web-Based CAD Framework for Distributed Design and Training

Advantages and challenges of Distributed design were discussed regularly by a panel of experts from industry and academia assembled at Design Automation Conferences (DAC 1998-2001) and WEB-based CAD tools development accords to one of the major trend of scientific researches which are carrying on by universities and companies specialized on practical realization of virtual laboratories with WEB-based CAD tools. The WEB-based CAD framework implementation is going to use the Internet tools and protocols to support the cooperation of several groups of designers working on the common tasks at their different stages.

The goal of the proposed project is developing methodology of WEB-based CAD tools re-engineering and training on the example of original Eastern European software system ALLTED (ALL Technologies Designer) being developed in the former Soviet Union for the simulation, analysis, optimization and design of nonlinear dynamic systems of any type and size: electrical, mechanical, hydraulic, pneumatic, thermal, electromagnetic, etc. or there mixed combinations. It is applying to MEMS (Microelectronic mechanical systems), robotics, numerical control machines tools, aircraft and automotive industries, heavy equipment and test equipment, agricultural and other applications, where different drives, transmissions, control units, valves, elements, etc. are used. At the aria of electronic circuits and systems design it will help considerably to improve objects` performance, reliability and maintainability.

Here are some aims of proposed project:

1. Developing and maintenance of the remote access through the Internet to CAD software, which are in the various states and probably on different continents.
2. Developing the technique of interactive network access to the remote software.
3. Providing investigation of different variants of the remote access interface realization on the basis of technologies CORBA, DCOM, JAVA.
4. Developing algorithms and software of the educational WWW-server with the remote access to ALLTED, appropriate client part and information databases, which contain modern components models and lists of their parameters.
5. Updating the software of ALLTED functional blocks with the purpose to incorporate parallel algorithms of the solving of the large sparse systems of the linear equations, parametrical optimization and statistical analysis.
6. Development of libraries of nonlinear functions, models of nonlinear components and lists of parameters to them, which reflect the state of modern components base.

The re-development of ALLTED tools gives an ability to meet the modern demands to EDA (Electronic Design Automation) training and usage. Implementing some parallel algorithms in the ALLTED tools will result in using a computer network not only as a communication tool, but also as powerful multiprocessor complex that greatly increases the effectiveness of CAD utilization.

CAD software in online mode will give an ability for employees of local small and middle enterprises (say, at Ukraine and other countries) to learn how to carry out own design work on host Internet servers with using foreign CAD tools, and will give them an opportunity to take a part in international distributed collaborative design and will provide ways of realization of competitive products on base of international standards. When such licensed CAD software is put on University server the number of remote learners will considerably increased.