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Title: On-line Applications in Science and Education

Abstract: In this presentation we are going to show selected web applications, which are related to the following topics: numerical solutions of PDE's (heat transfer equation), financial mathematics (stochastic differential equations), solid mechanics (truss structures, 2D plane stress problem), matrix algebra, education (on-line homework system), logic (theorem proving), interval and fuzzy algebra, interval probability, solutions of systems of equations with random parameters, distributed computing.

On-line web-applications have many advantages. They are available 24 hours per day. They are cross-platform i.e. it is possible to use them on many platforms Windows, Mac OS, Linux, FreeBSD etc.. It is possible to update them very easily. They allow the use of centralized data storage and they are easy to backup. On-line web applications are interactive, dynamic (can be extended very fast, sometimes in the real time), distributed (we can use servers from the whole world) and allow secure use of multimedia (video, sound). This is big advantage over textbooks, which are printed on paper and it is very hard to modify the content in order to adjust to the current needs of science and education. Web-applications can be much cheaper (at the same time much bigger) and more environmentally friendly (they can be used infinitely many times by unlimited amount of users and do not require paper). Web applications do not age (paper can be damaged in many different ways). Web applications can be used in on-line and traditional learning process.