Dynamic Mathematics on Smartphones and Tablets

Kleinwort, Lennart

This project in its present form is the creation of a new generation of a mathematical system for dynamic geometry, calculus and algebra. The initial idea was to create a modern mathematics application for smartphones and tablets which can be used for scientific or eductional purposes. Unlike conventional PC-based systems its specific intention is to combine the special features of smartphones and tablets with mathematics. It is possible to draw geometric objects by hand and later change them with gestures and multiple fingers. A simple user interface allows the creation of geometry and calculus worksheets, even with complicated relationships. New algorithms based on caching and tree structures were developed to enable fast and accurate math calculations even on low end devices. Furthermore a completely new very powerful computer algebra system was programmed which can solve equations and simplify, integrate and differentiate even complicated expressions. This new technology software has many advantages and beats existing ones in many fields. The smartphone and tablet based Software can be used by students in schools to make mathematics more interesting for them. On top of that the work extends the current knowledge of mathematical systems by new ideas, algorithms and possibilities.

Awards Won:

Intel ISEF Best of Category Award of $5,000

First Award of $5,000