

## Interval Computation App

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Technology has been growing at a rapid pace and, therefore, society relies much more on it every day. Nowadays, technology is used for solving problems that have a great impact in the world and/or in certain situations. Consequently, software solution precision is one feature that matters the most, because lacking it would cause a failure in the long run of the software. Software failures may come with dangerous consequences for the user(s). For instance, the patriot missile miscalculation, which resulted in the destruction of an army barracks where 28 people deceased and other 97 were injured [1]. It is remarkable how a small difference in a mathematical calculation can cause a disastrous situation. Here is where the use of intervals for computer calculations proves to be valuable. Evaluation methods using interval arithmetic to solve equations can be easily implemented in a computer. However, the time required to run such interval techniques is usually higher than for their real-number counterparts. This leads us to the following question: Could solving such problems and implementing approximation methods in mobile devices be possible? Since mobile devices have less power than a computer, solving and implementing interval arithmetic problems represent a challenge. In order to address this challenge, our idea consists in looking for the solution of a system of equations in a subspace instead of within the whole original space. This procedure allows us to reduce the number of unknowns that the program needs to find, which represents a reduction in the runtime and a reduction of the overestimation making our program feasible for small devices.

[1] McQuaid, P. A. (2012). Software disasters--understanding the past, to improve the future. *Journal Of Software: Evolution & Process*, 24(5), 459-470. doi:10.1002/smr.500