Searching for loci using DGS and CAS

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Searching for geometric loci belongs to the traditional part of mathematics school curricula all over the world. This topic is generally considered to be quite difficult for students, despite many well–known loci are around us, such as lines, circles or conics.

Nowadays new computational technologies substantially facilitate investigation of loci, especially in a plane. Dynamic geometry software such as Cabri, GeoGebra, Sketchpad and others offer several methods how to describe the locus. The use of this software enables to draw the desired locus and mostly to obtain its locus equation. The use of a new GeoGebra command LocusEquation which provides an analytic description of the sought locus based on the theory of automated theorem proving is presented.

In the talk a few examples which are accompanied with possible solutions and comments are given.

By searching for the locus we will apply Groebner bases and Wu–Ritt methods using software CoCoA[1] and Epsilon library[2].

References

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[1]Program CoCoA is freely distributed at `http://cocoa.dima.unige.it`

[2]Program Epsilon is freely distributed at `http://www-calfor.lip6.fr/˜wang/epsilon/`