ADDING SYMBOLIC PROVING AND DISCOVERING CAPABILITIES TO GEOGEBRA.

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ABSTRACT

While *GeoGebra* can work wonders illustrating geometric properties, these can seldom be justified and become no more than visual proofs. Adding symbolic capabilities to *GeoGebra* would allow not only to prove known results, but also to discover new properties in a mathematically sound way.

Botana and Valcarce developed their own DGS (named *GDI*, see [2]) which, besides offering the standard functionalities, uses *Mathematica* and *CoCoA* to symbolically manipulate the algebraic information derived from geometric diagrams.

Several videos illustrating its use are available in the following *YouTube* channel:

http://www.youtube.com/user/mabanades

Moreover, the authors have developed *LAD* and *LADucation*, two web applications to remotely prove and discover geometric properties for constructions in *Cabri*, *Geometer's Sketchpad* and *Cinderella* (see [3]).

Instructions and examples can be found in

http://nash.sip.ucm.es/LAD/LAD.html

http://nash.sip.ucm.es/LAD/LADucation.html

The modification proposed is the implementation of these ideas in *GeoGebra* together with the reported ongoing CAS integration.

As an example of the kind of problems that *GeoGebra* would be able to tackle after implementing the proposed functionalities, the computation of the equation of an envelope related to a generalized trammel of Archimedes (see [1]) will be demonstrated by using *GeoGebra* and *Singular* within a *SAGE* worksheet.

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