

1051-14-198

Anton Leykin*, leykin@math.gatech.edu. *Numerical Algebraic Geometry for Macaulay 2*. Preliminary report.

This long-term software project aims at implementing algorithms of numerical algebraic geometry in the computer algebra system Macaulay 2. We report on the progress in the beginning stage of the project: the performance of the current implementation of basic polynomial homotopy continuation routines is compared to that of the other software systems.

The routines used in the existing software are driven by heuristics and do not rigorously certify the correctness of homotopy path tracking. We provide a certification method and discuss the trade-offs in performance associated to implementing fully certified numerical algorithms. (Received August 25, 2009)