

Geometry Seminar  
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Room 201 WWH at 6:00 P.M.

# On the Computing Time of the Continued Fractions Method

Werner Krandick,  
Drexel University

Algorithms for polynomial real root isolation are ubiquitous in computational real algebraic geometry but few lower bounds are known for their maximum computing time functions. One exception is the continued fractions method due to Vincent (1836) and recommended by Uspensky (1948).

Collins and Akritas (1976) proved that the maximum computing time of the method is at least exponential in the length of the coefficients of the input polynomial. That lower bound motivated two algorithmic innovations, the bisection method by Collins and Akritas (1976) and the continued fractions method with root bounds (Akritas 1978, Sharma 2007). To this day no non-trivial lower bounds are known for the maximum computing time functions of either one of those methods.

This talk reports on joint work by Collins and Krandick that establishes such a bound for the continued fractions method with root bounds through a series of about eighty theorems and lemmas.

For more information please visit the seminar website at:  
[http://www.math.nyu.edu/seminars/geometry\\_seminar.html](http://www.math.nyu.edu/seminars/geometry_seminar.html).