



Joint Seminar

with the

Ontario Research Centre for Computer Algebra,
The Department of Computer Science,
The Department of Applied Mathematics,
and
The Department of Mathematics

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Joint INRIA/UPMC/LIP6, Project-Team SALSA, Laboratoire d'Informatique de Paris 6

FRIDAY, OCTOBER 28, 2011

2:30 P.M. – Middlesex College Room 320

“Polynomial System Solving over the Reals: Algorithms, Complexity, Implementations and Applications”

Abstract: Solving non-linear algebraic problems is one of the major challenges in scientific computing. In several areas of engineering sciences, algebraic problems encode geometric conditions on variables taking their values over the reals. Thus, most of the time, one aims to obtain some informations on the real solution set of polynomial systems. The resolution of these problems often has a complexity which is exponential in the number of variables.

In this talk, I will review some geometric and algebraic techniques which enable to obtain fast practical algorithms meeting the best known complexity bounds. These algorithms are implemented in the maple package (RAGlib: The Real Algebraic Geometry library) which has the feature to provide algorithms of asymptotically optimal algorithms in real geometry. Its practical performances will be discussed and some applications will be presented.

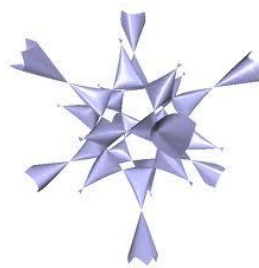
This talk is based on joint works with J.C. Faugere, A. Greuet, E. Schost, PJ Spaenlehauer and L. Zhi.



Baby-giant steps in computing



PJ Spaenlehauer



E. Schost

We inhabitants of Middlesex College have so much fun and happy spirits, but what connects us all? It is real algebraic geometry: It is Real yet it is complex, beautiful, intriguing, challenging, and useful. We are very pleased to introduce a perfect, internationally well-known expert, **Mohab Safey El Din**, to tell us about the state of the art of using ingenious mathematical techniques to obtain fast, practical algorithms for solving equations over reals.