

THE UNIVERSITY



OF HONG KONG

Department of Mathematics

Numerical Mathematics and Applied Analysis Group Seminar (NMAA)

Lecture Series –

**A numerical linear algebra framework for solving
problems with multivariate polynomials**

Lecture 3: Applications

Dr. Kim Batselier

Department of Electrical and Electronic Engineering, HKU

**on Thursday, February 27, 2014 at 2:30pm
in Room 309, Run Run Shaw Building, HKU**

Abstract

In this final seminar we will discuss three applications: elimination of variables, multivariate root-finding and computing an approximate least common multiple (LCM) and greatest common divisor (GCD). Elimination of variables will be achieved by computing intersections of subspaces by means of principal angles. We will also show how all the roots of a given multivariate polynomial system can be found from an eigenvalue problem. We will present an SVD-based root-finding algorithm. The computation of an approximate least common multiple and greatest common divisor will correspond to the determination of a nontrivial intersection between subspaces and solving a least squares problem respectively. We will also present an example of blind image deconvolution by means of an approximate GCD computation.

Biography:

Kim Batselier received his Master of Science degree in Electrical Engineering from the KU Leuven, Belgium in 2005. He then worked for BIORICS on the development of real-time monitoring algorithms that use system identification techniques to monitor professional football players during their training. This was in collaboration with Milan Lab, the research centre of AC Milan. In 2013 he obtained a Ph.D. degree at the STADIUS research unit of the Department of Electrical Engineering of the KU Leuven, under the supervision of Prof. Bart De Moor. Currently, he is a post-doctoral research fellow at The University of Hong Kong. His main research interests are numerical linear and polynomial algebra, systems theory, scientific computing and signal processing.

All are welcome
