The Hong Kong University of Science and Technology

Department of Mathematics

<u>Seminar on Applied Mathematics</u>

The Fundamentals of Compressive Sensing
Lecture 1 & 2

by

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<u>Abstract</u>

Lecture 1:   The Standard Problem and First Algorithms
This lecture introduces the question of sparse recovery, establishes its theoretical limits, and presents an algorithm achieving these limits in an idealized situation. In order to treat more realistic situations, other algorithms are necessary. Basis Pursuit (that is, ℓ_1-minimization) and Orthogonal Matching Pursuit make their first appearance. Their success is proved using the concept of coherence of a matrix.

Lecture 2:   The Restricted Isometry Property
In this lecture, the coherence is replaced by the concept of restricted isometry constant. This allows one to prove the robust null space property, which is equivalent to the robustness of ℓ_1-minimization for sparse reconstruction. It is also shown that the restricted isometry property guarantees the success of other algorithms such as Iterative Hard Thresholding and Orthogonal Matching Pursuit. Finally, the existence of matrices satisfying the restricted isometry property is established.

Date: *Saturday, 9 December 2017*

Time: *1:30p.m. – 3:30p.m.*

Venue: *Room 3494, Academic Building*
                 (near Lifts 25 & 26), HKUST

All are welcome!