

Title:

Bayesian methods for Inverse problems of imaging systems.

Abstract:

Image reconstruction in different imaging systems is a typical inverse problem. Depending on the context, we may have: passive or active, transmission or echographic systems. X ray Computed Tomography (CT) and microwave inverse scattering are two examples of active imaging. Infra Red (IR) imaging is an example of passive imaging and ultrasound imaging are in general in the echographic mode.

The main idea in all these imaging system is first establish a forward model linking the observable data to the unknowns. The second step, much more difficult, is the inversion which is in general an illposed problem.

Deterministic regularization methods and the Bayesian inference methods have been used with success during the past 30 years in different area, of medical and industrial imaging systems. In this talk, I will give an overview of these approaches with a few examples particularly in X ray and microwave imaging.