Title:
Spatio-temporal modelling of health data: Challenges and opportunities

Abstract:
The "big data" era has resulted in a new generation of health and social research that integrates information from multiple sources to enrich study designs and to create innovative study populations through the use of record linkage technologies. Geographic Information Systems (GIS) provides another very powerful way to enhance a study population via geocoding. Knowing where study subjects live allows investigators to incorporate information about socio-demographic characteristics of their community and to explore the impact of these factors on the health of individuals living in that community. Although conceptually simple and appealing, there are a plethora of challenging and interesting technical problems that arise from such linked data studies. In this talk, we focus on the development of computationally efficient algorithms for the spatio-temporal analysis of disease incidence data. In particular we explore the impact of spatially varying covariates such as socioeconomic status and describe some of the interesting technical challenges, including accounting for measurement error and linkage errors. Examples from cancer and reproductive health will be used as illustration.