

The College of Arts & Sciences
Department of Mathematical Sciences

Colloquium

Professor Noel Cressie

University of Wollongong

Thursday, February 8, 2024

French Hall West, Room 4211

4:00-5:00pm

Spatial prediction of non-negative spatial processes using asymmetric loss functions

A major component of inference in spatial statistics is that of spatial prediction of an unknown value of a latent spatial process, based on noisy measurements of the process taken at various locations in a spatial domain. The most commonly used predictor is the conditional expectation of the unknown value given the data. By considering the spatial-prediction problem from a decision-theoretic viewpoint, one can recognize the conditional expectation as optimal for squared-error loss (SEL). In this talk, we consider spatial prediction of processes that take non-negative values. A family of power-divergence loss functions, which is indexed by the choice of a power parameter, is well defined for predictor and predictand when the spatial process is non-negative, and the power parameter controls the asymmetry of the losses. Taking a hierarchical spatial-statistical-modelling approach, it can be seen that this new class of asymmetric loss functions generates new optimal spatial predictors. An application is given to spatial prediction of zinc concentrations in soil on a floodplain of the Meuse River in the Netherlands. This talk is based on joint research with Alan Pearse and David Gunawan, School of Mathematics and Applied Statistics at the University of Wollongong, Australia.

**Refreshments will be served 3:15-3:45 pm in the Faculty Lounge
4118 French Hall West**

UNIVERSITY OF 
Cincinnati