

GRADUATE SEMINAR

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A Bivariate Type II Generalized Crack Distribution with Applications

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3:30 pm

Location: Centre for Kin, Health & Sport 185

<https://uregina-ca.zoom.us/j/94125367372>

Abstract: The Birnbaum-Saunders distribution has seen several extensions, yet its main applications are restricted to reliability and survival analysis. Although some extensions allow for higher flexibility, due to the thin-tailedness inherited from the normality of their base density, their application for heavy-tailed data modelling is limited. An extended version, the so-called Type II generalized crack (GCR2) distribution, built on an appropriate base density, provides a sufficient level of flexibility to fit various distributional shapes including heavy-tailed ones. Some practical applications require a bivariate or, more generally, a multivariate extension of the heavy-tailed distribution.

In this seminar, a bivariate extension of the Type-II generalized crack distribution will be discussed with three specific examples which are fitted to both simulated and real catastrophic loss datasets. The expectation-maximization algorithm is implemented to obtain the maximum likelihood estimators of the bivariate GCR2 distribution. The model fitting results on the catastrophic loss dataset show that the bivariate GCR2 distribution with the generalized Gaussian base density fits the data significantly better than other alternative models.