

# Math and Stat Colloquium

Monday, March 1

3:30pm BUS 214

Refreshments will be served in the Lund Hall Foyer at 3:00pm

**Speaker:**

**Renato Assuncao**

**Department of Statistics**

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## **"Knox meets Cox: Adapting Epidemiological Space-Time Statistics to Demographic Studies"**

**Abstract:** Many important questions and theories in demography focus on changes over time, and on how those changes differ over geographic and social space. Space-time analysis has always been important in studying fertility transition, for example. One formal method, used widely in epidemiology and public health, is Knox's space-time interaction test. In this paper, we discuss the use of the Knox test in demographic research, and note some possible pitfalls. We demonstrate how to use familiar proportional hazards models to adapt the Knox test for demographic applications. These adaptations allow for non-repeatable events, and for the incorporation of structural variables that change in space and time. We apply the modified test to data on the onset of fertility decline in Brazil over 1960-2000, and show how the modified method can produce maps showing where and when diffusion effects seem strongest, net of covariate effects. This is joint work with Carl Schmertmann and Joseph Potter.