

# Bayesian Semiparametric Fully Smoothed Spatio-Temporal Modeling

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## ABSTRACT

Over the past decades a great deal of effort has been expended in the collection and compilation of high quality data on cancer incidence and mortality in the United States. These data have largely been used in the creation and disbursement of descriptive statistics concerning the state of cancer in the U.S. The information available through these statistics present limited information concerning spatial or temporal trends in the course of cancer in the U.S. Recently, there have been more efforts made to investigate these trends. Smoothing is the practice of modeling data in order to eliminate random variation from the observed data and provide estimates of the underlying process. Models are developed here that incorporate a number of techniques for smoothing spatial and spatio-temporal data. These include an additive model and two joint spatio-temporal models. Data analyzed includes mortality due to female breast cancer in Missouri from 1969-2000 and survey responses to the Missouri Turkey Hunting Survey, conducted by the Missouri Department of Conservation.