

# **A latent factor model for spatial data with informative missingness**

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A large amount of data is typically collected during a periodontal exam. Analyzing these data poses several challenges. Several types of measurements are taken at many locations throughout the mouth. These spatially-referenced data are a mix of binary and continuous responses, making joint modeling difficult. Also, most patients have missing teeth. Periodontal disease is a leading cause of tooth loss, so it is likely that the number and location of missing teeth informs about the patient's periodontal health. In this paper, we develop a multivariate spatial framework for these data which jointly models the binary and continuous responses as a function of a single latent spatial process representing general periodontal health. We also use the latent spatial process to model the location of missing teeth. We show using simulated and real data that exploiting spatial associations and jointly modeling the responses and locations of missing teeth mitigates the problems presented by these data.

This is joint work with Dipankar Bandyopadhyay (Medical University of South Carolina)