INTRODUCING GEOMETRY WITH SPATIAL SCAN STATISTICS

Jennifer M. Franko, Rachel Schwell, And William E. Wood

Abstract.

This module explores the role of non-Euclidean metrics in spatial scan statistics, a tool in biosurveillance. The problem is framed in a biological context while being formulated in mathematical terms. This includes a description of the algorithm and appropriate formulas, followed by both computational and philosophical questions. The formal definition and properties of metrics are also given and illustrated through discussions and exercises. The ultimate goal is highlighting the role and potential importance of geometry in the non-traditional setting of biosurveillance. The intended target audience is junior-level students whose majors include mathematics or related fields. However, leaving out the specifics of metrics makes this module appropriate for any math or critical thinking course, for example, Discrete Math.