

Centro de Investigação em Matemática e Aplicações
Departamento de Matemática
Programa de Doutoramento em Matemática

Seminar

16/04/2023, online, 15h

Zoom address: <https://videoconf-colibri.zoom.us/j/98650312699>

Hypothesis testing for geometric empty space survival functions*

Maikol Solís

(Professor, maikol.solis@ucr.ac.cr)

Centro de Investigación en Matemática Pura y Aplicada, Escuela de Matemática
Universidad de Costa Rica, San José, Costa Rica.

Abstract: In this talk we will establish a formal statistical validation for a surviving of empty space function, by employing a hypothesis test and a global envelope, to determine whether a data point cloud is a complete spatial random process (CSR). We use the alpha shape complex of a data point cloud in \mathbb{R}^2 to generate a map for this function. Then we establish a null hypothesis which corresponds to a CSR process, using two different test statistics and Monte Carlo tests. One of these test statistics is used to build a global envelope that delimits a region within which the null hypothesis cannot be rejected. We provide some theoretical and datasets examples to illustrate this procedure.

* This talk formed part of Edgar Hernández's master's thesis in applied mathematics. The thesis was supervised by Alberto Hernández from Universidad de Costa Rica and the speaker.

The main contributor to this work is Edgar Hernández.

Keywords: Alpha shape, Hypothesis test, Global envelope, Complete spatial random process, Monte Carlo test.