

Workshop in Commemoration of Prof. Zanzawi Soejeoti, Ph.D., Prof. Soebanar, Ph.D. and Prof. Drs. Suryo Guritno, M.Stats., Ph.D.

Spatial Data Analysis: Introduction to Spatial Interpolation (July 9, 2024, offline and online (Hybrid))

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Venue: Statistics Department, Universitas Islam Indonesia, Yogyakarta, Indonesia



Abstract

This learning program is designed to provide an in-depth understanding of spatial data concepts, the use of Quantum Geographic Information System (QGIS software), and spatial interpolation techniques commonly used in geographic data analysis. The program begins with a fundamental introduction to spatial data, including definitions, classifications, and its crucial role in various fields such as environmental science, urban planning, and epidemiology. The subsequent sessions will focus on the use of QGIS, a popular open-source software for managing, analyzing, and visualizing spatial data. Participants will be introduced to the QGIS interface and key features that support spatial data analysis. This learning includes practical tutorials on how to import data, edit layers, and use various analytical tools available in QGIS, enabling participants to perform basic spatial analysis and prepare data for the interpolation process.

Next, participants will delve into spatial interpolation, a technique used to estimate values at locations without data based on values from surrounding locations. The focus will be on the Inverse Distance Weighting (IDW) method. The training will begin with manual interpolation calculations (from scratch) to provide a deeper understanding of the process. Following this, participants will practice interpolation using QGIS. The final session of this program will teach spatial interpolation using the R programming language, incorporating various evaluation methods such as the Hold Out Method, K-Fold Cross Validation (KFCV), and Leave One Out Cross Validation (LOOCV). By leveraging R, participants will be capable of conducting more complex analyses and automating the interpolation process for larger-scale projects. Through this learning program, participants are expected to develop comprehensive skills in managing and analyzing spatial data, and applying appropriate interpolation techniques for various research, planning, and decision-making purposes based on spatial data.

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