

GEOSTATISTICS AND HYBRID PARTICLE SWARM-SIMULATED ANNEALING OPTIMIZATION IN RAIN GAUGES NETWORK SIMULATION

Mohd Khairul Bazli Mohd Aziz ¹, Fadhilah Yusof ², Zulkifli Yusop ³, Mohammad Afif Kasno ⁴

1 Faculty of Industrial Sciences & Technology, Universiti Malaysia Pahang, Malaysia,

2 Faculty of Science, Universiti Teknologi Malaysia, Malaysia,

3 Faculty of Civil Engineering, Universiti Teknologi Malaysia, Malaysia,

4 Faculty of Electrical and Electronic Engineering Technology, Universiti Teknikal Malaysia, Malaysia.

Abstract:

In designing an effective and economic hydraulic structure for flood control, an optimal design of rain gauge network is important as it produces fast, accurate and important rainfall data. In this paper, geostatistical method integrated with hybrid of particle swarm optimization-simulated annealing is used to simulate the optimal locations and number of raingauges station. The simulation process used different generated rainfall data based on real rainfall data. The rainfall data randomly generated based on the exponential semivariogram model and it showed similar characteristics with the mean and standard deviation that is almost the same with real rainfall data. The proposed method successfully obtained the optimal number of rain gauges despite different sets of generated rainfall data. This situation shows that the proposed method is adequate to be applied in another case study, in other places or different data.

Keywords: : Rain Gauges; Geostatistics; Particle Swarm Optimization; Simulated Annealing

ACKNOWLEDGMENT

The authors would like to thank Universiti Malaysia Pahang under UMP grant RDU1703196 for the technical and research support.