

**SPATIAL INTERPOLATION PATTERNS OF PM10 BASED ON  
LOCATION OF VIRTUAL STATIONS**

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## AUTHOR'S DECLARATION

I declare that the work in this thesis/dissertation was carried out in accordance with the regulations of Universiti Teknologi MARA. It is original and is the results of my own work, unless otherwise indicated or acknowledged as referenced work. This thesis has not been submitted to any other academic institution or non-academic institution for any degree or qualification.

I, hereby, acknowledge that I have been supplied with the Academic Rules and Regulations for Undergraduate, Universiti Teknologi MARA, regulating the conduct of my study and research.

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## **ABSTRACT**

Air quality monitoring stations is important to monitor the condition of air pollution and to control the air pollution. The limited number of existing air quality monitoring station has limited the accuracy of air quality assessment in Malaysia especially at micro-scale level. The aim of this study is to determine the spatial interpolation patterns of Particulate Matter (PM10) based on the location of virtual stations in Pulau Pinang using Landsat 8 Operational Land Imager (OLI) and kriging interpolation method. The objectives are to determine the virtual stations of PM10 and to identify the spatial variation of PM10 using kriging interpolation on virtual stations. In this study, the satellite image of Landsat 8 OLI which consists of new spectral bands are used to generate virtual stations based on the location of Continuous Air Quality Monitoring (CAQM) stations. Kriging interpolation method is also carried out to identify the spatial variation patterns in order to determine the concentration of PM10. Based on the result, there are 48 virtual stations generated based on the location of CAQM stations in Pulau Pinang. It is found that the virtual stations within residential area contribute the highest concentration of PM10 pollutants. Overall, the concentration of PM10 based on virtual stations in Pulau Pinang is possible to be identified. The finding has shown that the spatial interpolation pattern of PM10 is possible to be demonstrated based on location of virtual station. This information can be used by environmental department and local authorities for further development.

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