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BACHELOR OF SURVEYING SCIENCE AND GEOMATICS (HONOURS)

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ASSESSMENT OF TEMPORAL URBANIZATION AND LAND
SURFACE TEMPERATURE IN PULAU PINANG USING
GEOSPATIAL APPROACHES

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CENTRE OF STUDIES FOR SURVEYING SCIENCE AND GEOMATICS
COLLEGE OF BUILT ENVIRONMENT
UNIVERSITI TEKNOLOGI MARA MALAYSIA

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**Thesis submitted to the Universiti Teknologi MARA Malaysia
in partial fulfilment for the award of the degree of the
Bachelor of Surveying Science and Geomatics (Honours)**

AUGUST 2023

DECLARATION

I declare that the work on this project/dissertation was carried out in accordance with the regulations of Universiti Teknologi MARA (UiTM). This project/dissertation is original and it is the result of my work, unless otherwise indicated or acknowledged as referenced work.

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ABSTRACT

The rapid urbanization occurring in Pulau Pinang have severely affected the land surface temperature (LST). These changes result in higher temperatures, which worsens the already negative effects of global warming, leading to heat-related illnesses and deaths, increased energy and water demands, also reduced indoor and outdoor comfort. The aim of this study was to perform an assessment of temporal urbanization and land surface temperature in Pulau Pinang using geospatial approaches. The objectives are to classify urban area in Pulau Pinang for 5 years interval using Landsat data, derive the land surface temperature from Landsat 8 from 2015 and 2020, and quantify the relationship between urbanization, land use land cover and land surface temperature. ArcGIS Pro manages the processes for LST determination including emissivity computation and spectral radiance conversion. Erdas Imagine process Land Use Land Cover (LULC) classification, and remote sensing indices help derive the Normalised Difference Built-Up Index (NDBI). The study's using Microsoft Excel to find the regression analysis of this research, which shows the effect of urbanization on LST and shows how many variables interact. The findings point out how urbanization and land surface temperature play a critical role in determining regional temperatures, requiring methods for sustainable urban planning and climate-resilient development.

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