

**GEOSPATIAL IDENTIFICATION OF POVERTY AREAS: MACHINE LEARNING  
APPROACH FOR DSWD IMUS**

Undergraduate Thesis  
Submitted to the Faculty of the  
Department of Computer Studies  
Cavite State University  
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In partial fulfilment  
of the requirements for the degree  
Bachelor of Science in Computer Science

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## ABSTRACT

**MACAPOBRE, ROMMEL M., REGALADO, NINO S., Geospatial Identification of Poverty Areas: Machine Learning Approach for DSWD Imus.** Undergraduate Thesis. Bachelor of Science in Computer Science. Cavite State University, Imus, Cavite. June 2024. Adviser. Ms. Mildred Apostol.

The researchers initiated this study in January 13, 2024 and conducted it in April 12, 2024 at department of social welfare and development . The researcher applied the Descriptive research design in conducting the study. Descriptive research design involves systematically observing, documenting, and analyzing characteristics or phenomena within a population without influencing or altering them. it aims to provide detailed portrayal of the subject under study. In creating this thesis, the proponents used the Agile Software Development. it refers to the software development methodologies centered round the idea of iterative development. This study proposes a poverty mapping utilizing Geographic Information Systems (GIS) integrated with machine learning techniques. PHP and JavaScript programming language. By harnessing the power of GIS, survey, and census data at varying spatial resolutions, this system offers a dynamic and detailed visualization of poverty rates. Through the integration of machine learning algorithms and geographical data, such as satellite images, the system provides granular insights into the socio-economic dynamics underlying poverty. A case study of Imus City, Cavite, demonstrates the efficacy of this approach. The Department of Social Welfare and Development (DSWD) in Imus can utilize this system to pinpoint areas of poverty and identify specific needs and vulnerabilities within those areas. By tailoring interventions based on these insights, DSWD can address the root causes of poverty and promote sustainable development effectively. This research highlights the importance of technological innovation in enhancing poverty mapping efforts, ultimately leading to more efficient resource allocation and better-targeted social welfare programs.

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# **GEOSPATIAL IDENTIFICATION OF POVERTY AREAS: MACHINE LEARNING APPROACH FOR DSWD IMUS**

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An undergraduate thesis outline submitted to the faculty of the Department of Computer Studies, Cavite State University, Imus, Cavite in partial fulfillment of the requirements for the degree of Bachelor of Science in Computer Science with Contribution No. BSCS-THE-02-2024-000-015. Prepared under the supervision of professor. Mildred T. Apostol.

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## **INTRODUCTION**

A poverty mapping system using Geographic Information Systems (GIS) is an effective tool for examining and displaying data on poverty. Survey and census data at various spatial resolutions can be integrated by systems to give precise and comprehensive insights into poverty rates. These techniques aid in locating high-poverty areas, like Imus City in Cavite. The integration of GIS technology with Web development techniques facilitates the construction of intuitive platforms for the mapping of poverty data. Systems help with data processing and make it easier for the general public to receive important information. Social welfare programs might not be able to properly target the people who need help the most without a mechanism for mapping poverty. This may lead to an ineffective distribution of resources and underserving of people who are already vulnerable. Through the utilization of geographical analysis and data, a poverty mapping system provides insights that go beyond conventional metrics of poverty. It sheds light on the underlying socio-economic dynamics at work in addition to merely calculating income levels. With a system like this in place, DSWD Imus is able to identify not only pockets of poverty but also the particular vulnerabilities and needs that exist inside them. For the



purpose of creating interventions that target the underlying causes of poverty and advance sustainable development, this level of detail is crucial.

### **Background of the Study**

In order to combat poverty and improve the lives of those who are less fortunate, the Department of Social Welfare and Development (DSWD) is crucial. A primary challenge facing the DSWD is precisely determining and charting areas of poverty. Conventional approaches to poverty mapping generally depend on static data sources and do not offer the spatial detail required to effectively target solutions.

Geographical technology with support from Python programming and machine learning methods. Give a workable solution for enhancing the mapping of poverty. Innovative machine learning techniques can be used to combine geographic data, such as satellite photos, with spatial data to create a dynamic and comprehensive poverty mapping system.

### **Statement of the Problem**

The aim of creating a poverty mapping system for the Department of Social Welfare and Development (DSWD) is to better understand, visualize, and address poverty areas in Imus, Cavite. The main problem sought to answer the following problems;

DSWD finds it difficult to determine which barangay at Imus will be needing their assistance when they are conducting events or programs. This sometimes results in providing assistance to families that are not really within the scope of the poverty areas in the said barangay which leads to being unfair to those who are really in need. *"Without the help of poverty mapping, can they easily locate the poverty areas in Imus, Cavite?"*.