

## **Abstract**

In the development of the Android-based Smart Farm application to support Indonesia's food security, this research employs the Object-Oriented Analysis and Design (OOAD) methodology. OOAD is systematically utilized to delineate the functional and non-functional requirements of the application and to design the object structure and inter-object interactions. Requirements analysis involves a literature review and field observations in the Bandung Regency, forming the foundation for designing an application that utilizes image processing and artificial intelligence technologies to aid farmers in identifying leaf diseases in rice plants. Class modeling, use case diagrams, and activity diagrams are employed in the design phase to illustrate the application's structure and workflow. Implementation utilizes object-oriented programming, enabling the translation of the design structure into well-organized and comprehensible code. Validation results demonstrate a 100% functionality rate and an 80% accuracy in disease detection, yet the study highlights the need to enhance accuracy by providing more training data and improving image quality. Thus, the application of OOAD not only ensures an organized structure but also supports the research goal of enhancing farmers' knowledge, reducing dependency on pesticides, and promoting sustainable agriculture in the future.

**Keywords:** Rice, application, disease, plant, detection