

**ASSESSING THE POTENTIAL OF CONVOLUTIONAL NEURAL
NETWORK(CNN) IN THE DETECTION OF
DISEASES OF CUCURBITS**

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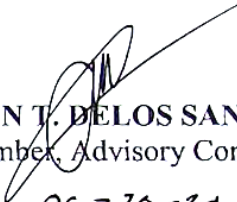
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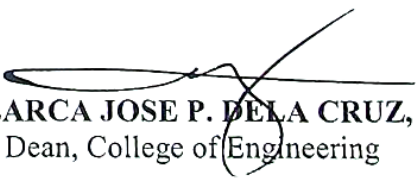
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BIOGRAPHICAL SKETCH

Vashtine P. Liwanagan was born on October 2, 2001, in Balanga City, Bataan. He grew up in a close-knit family with one older sister. His academic journey began at Tomas Pinpin Memorial Elementary School, where he excelled in his studies and showed a keen interest in Mathematics, Science, and Music.

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Vashtine enjoys spending time with his family, working out, and volunteering to help the community. He is passionate about giving back to his community and hopes to make a positive impact in the world through his work while still enjoying living life as best as he can. The view of the future ahead of Vash is something that he is looking forward to; creating new experiences and endeavors and meeting people along the way is what keeps his life lively.

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ABSTRACT

LIWANAGAN, VASHTINE P. AND YARCIA, IMMAN DIEVE R.,
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ASSESSING THE POTENTIAL OF CONVOLUTIONAL NEURAL
NETWORK(CNN) IN THE DETECTION OF DISEASES OF CUCURBITS.

Adviser: ELIZA E. CAMASO, M.Sc.

Cucurbits, including cucumbers, melons, pumpkins, squash, and gourds, are part of the Cucurbitaceae family with a millennia-long historical significance. They have been pivotal to civilizations globally, contributing to food security, economic growth, and cultural heritage. In modern agriculture, cucurbits remain indispensable, thriving in diverse climates, providing nutrition, and promoting sustainable farming practices.

This study utilizes computer vision and machine learning techniques to tackle challenges in cucurbit production, explicitly focusing on disease detection. The objective is to harness convolutional neural networks (CNN) for early disease identification in cucurbit crops, progressing through three phases: identifying common diseases, developing a CNN-based smart detection system, and evaluating system accuracy and reliability.

The methodology involves designing a conceptual framework to guide CNN model training for disease detection. Sample images collected from agricultural fields are standardized using an Image data generator. The CNN model is trained to extract relevant features from the images, enabling disease classification. Evaluation metrics, including precision, recall, and F1-score, are analyzed using a confusion matrix. Results show promising performance, with an overall accuracy of 73%. Additionally, the study

demonstrates the model's improved performance with increasing training epochs, indicating its real-world application potential.

In conclusion, this research underscores the significance of computer vision in revolutionizing disease management strategies in cucurbit production. By integrating technology into agricultural practices, farmers can enhance disease detection, mitigate yield losses, and ensure the sustainability and productivity of cucurbit crops.

Keywords: Cucurbits, computer vision, machine learning, convolutional neural networks (CNN), disease detection.

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