



UNDERGRADUATE THESIS

**HUMAN SKIN DISEASE CLASSIFICATION
USING SWINTRANSFORMER WITH THE
DEVELOPMENT OF A KNOWLEDGE-BASED
TREATMENT RECOMMENDATION SYSTEM**

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INFORMATICS STUDY PROGRAM
SURABAYA
2026**

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**HUMAN SKIN DISEASE CLASSIFICATION USING SWIN
TRANSFORMER WITH THE DEVELOPMENT OF A KNOWLEDGE-
BASED TREATMENT RECOMMENDATION SYSTEM**

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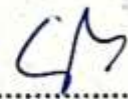
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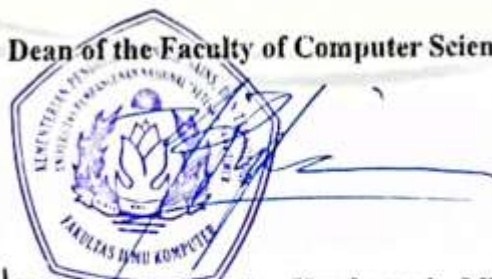
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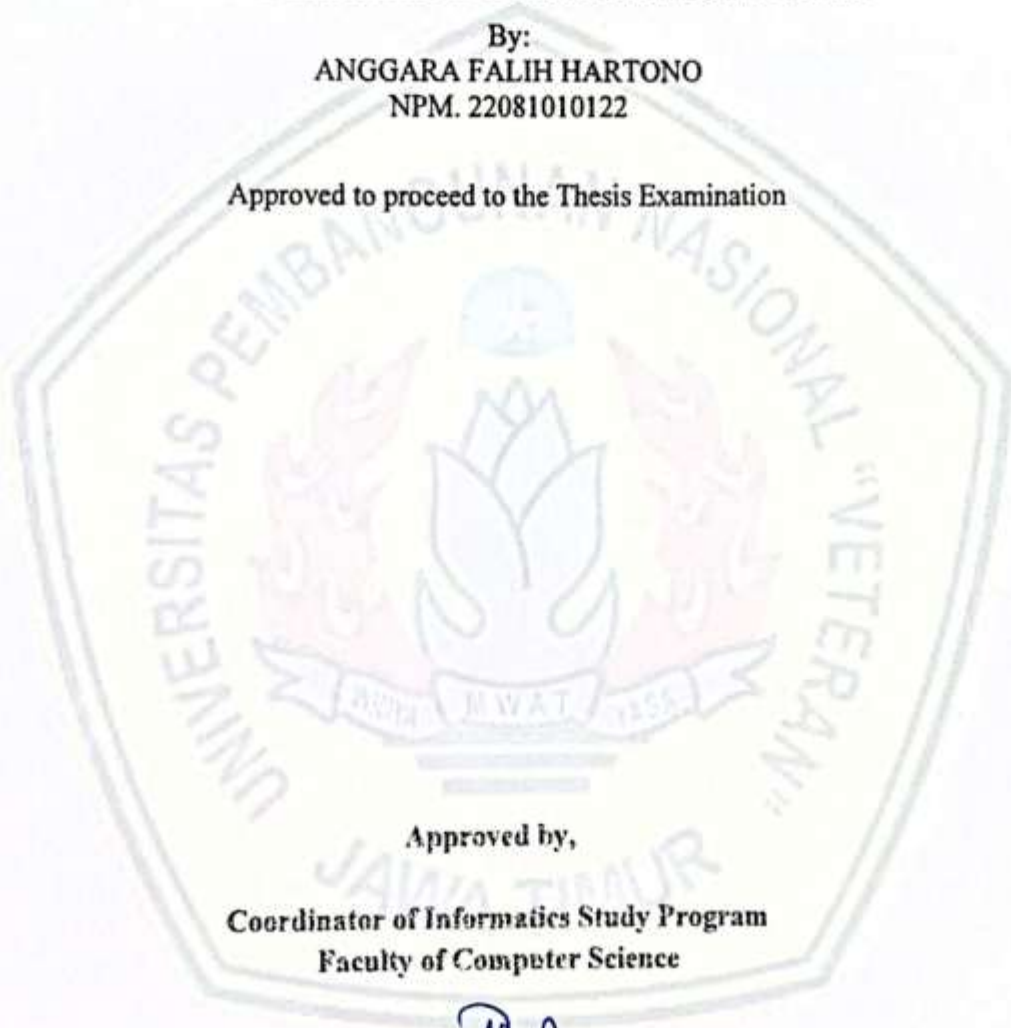
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ABSTRACT

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Thesis Title : Human Skin Disease Classification Using
Swin Transformer with the Development of a
Knowledge-Based Treatment
Recommendation System
Advisor : 1. Eva Yulia Puspaningrum, S.Kom, M.Kom
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Skin disease is one of the most common health problems and can significantly affect patients' quality of life. The diagnosis process is generally performed through visual observation of lesion characteristics, such as color, shape, and texture. However, visual similarities among different skin diseases often create challenges in the initial identification process. This study aims to develop a human skin disease classification system using the Swin Transformer architecture and a knowledge-based treatment recommendation system based on the Clinical Practice Guidelines published by the Indonesian Society of Dermatology and Venereology (PERDOSKI).

The dataset consists of four skin disease classes, namely *Acne*, *Melanoma*, *Tinea*, and *Verruca/Warts*. The proposed model was developed using the Swin Transformer architecture with the best experimental configuration consisting of an 80:20 data split ratio, a *learning rate* of 1×10^{-4} , a *batch size* of 32, and 100 *training epochs*. *Transfer learning* was applied to improve the model's capability in extracting discriminative visual features from skin lesion images. After the classification process, the system provides treatment recommendations according to the predicted disease category.

Experimental results show that the proposed model achieved an accuracy of 92.27%, a *weighted precision* of 92.25%, a *weighted recall* of 92.27%, and a *weighted F1-score* of 92.25%. In addition, the model obtained a macro F1-score of 92.22%, indicating a *balanced* classification performance across all classes. The *Melanoma* class achieved the highest performance with an F1-score of 96.52%, while the *Verruca/Warts* class obtained an F1-score of 87.50%. These findings demonstrate that the Swin Transformer architecture is highly effective for multi-class skin disease classification and can be integrated with a recommendation system to support preliminary disease identification and provide treatment-related information for users.

Keywords: Skin Disease, *Swin Transformer*, *Deep learning*, Image Classification, Recommendation System, *Knowledge based*.

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The author realizes that in the preparation of the following thesis there are many shortcomings. For this reason, constructive criticism and suggestions from all parties are highly expected for the perfection of writing the following thesis. Finally, with all the limitations that the author has, hopefully the following report can be useful for all parties in general and the author in particular.

Surabaya, June 24th 2026

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