

***Detection of Aedes Aegypti Larvae in Jember Regency Using Deep Gated
Recurrent Unit Method***

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ABSTRACT

Dengue Hemorrhagic Fever (DHF) remains a major public health issue in Indonesia. In 2024, Jember Regency recorded 1,627 cases, with the Larvae Free Index (LFI) averaging only 92%, below the national standard of >95%. This study developed an automatic mosquito larvae detection system using a Deep Learning approach based on CNN and GRU. Visual features were extracted using the InceptionV3 model and then analyzed sequentially by the GRU for larval classification. The results showed that the model achieved optimal training and testing performance at the 20th epoch with 99.19% accuracy and a loss of 0.0419. Compared to the previous method AOA, which achieved only 84% accuracy, this approach proved to be more accurate and robust against variations in data conditions. The system has the potential to support automatic larvae monitoring for more effective and efficient DHF control.

Keywords: *Dengue Hemorrhagic Fever, Aedes aegypti, Larvae-Free Rate, Deep Learning, Gated Recurrent Unit, Automated Detection*