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Abstract

"Aedes Vigilax" Detection from Buzz: Deep Learning Classification †

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Poor or excessive nutrient management may result in the generation of mosquitos in vineyards which is a potential impact of vineyards on residential areas. Some species of mosquitos are a real threat to human society. For instance, a link was observed between vineyards and the West Nile virus which spreads via mosquitos [1]. Thus, a continuous effective monitoring system is required to ensure the mitigation of mosquito-borne diseases originating from orchards and vineyards. Numerous image-based machine learning (ML) approaches have been utilized in mosquito systematics, but considering the small body size, these models often required high-resolution images and sophisticated pre-processing algorithms to result in high accuracy. Moreover, those classifiers often do not generalize well across different datasets due to a relatively small number of Aedes samples. In this paper, we adopt a one-class perspective for mosquito detection, where the detection classifier is trained with Aedes vigilax mosquito class samples only, which is a major coastal pest species for NSW and more northern areas and for parts of coastal SA. Our model employs a BERT module for visual embeddings and for classification. A comprehensive evaluation with a benchmarking dataset demonstrates the better performance of our model than existing approaches.

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Reference

1. Crowder, D.W.; Dykstra, E.A.; Brauner, J.M.; Duffy, A.; Reed, C.; Martin, E.; Peterson, W.; Carrière, Y.; Dutilleul, P.; Owen, J.P. West Nile Virus Prevalence across Landscapes Is Mediated by Local Effects of Agriculture on Vector and Host Communities. *PLoS ONE* **2013**, *8*, e55006. [CrossRef] [PubMed]

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