# UNIVERSITI TEKNOLOGI MARA

# IDENTIFICATION OF FEASIBLE FLYING PATTERN OF DRONE FOR VICTIM IDENTIFICATION IN REMOTE DISASTER AREA

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Thesis submitted in fulfillment
of the requirements for the degree of
**Master of Science**
**(Electrical Engineering)**

**College of Engineering**

**September 2022**

# ABSTRACT

Recently, a drone has been widely used for numerous applications. Drones are also beneficial in difficult-to-access areas, especially during disasters. Considering the large scale of the disaster areas that lack network coverage and the limitations of ad hoc networks, an effective flying pattern is needed to scan the area and transmit data to the base station effectively. Therefore, this research investigates related works on the flying patterns of drones, the network technology used, and the performance of the Flying Ad hoc Networks (FANETs) in terms of throughput. Through extensive literature, 90% of the research deploys more than one drone with different types of mobility and various covered areas. Practically, a high number of drones during the search and rescue mission will increase the cost. The main objective is to identify the most efficient flying pattern for search and rescue. The analysis was conducted using OMNeT++ simulator version 5.2.1 with Inet 3.6.2 and fieldwork implementation at Pulau Sebang, Malacca. The simulation and real implementation outcome shows the possibility of using a single drone in a search and rescue mission, with a Square flying pattern being the most effective flying pattern. Percentage of Coverage area during the real implementation outperformed the simulation result by 2.04% with real-time video streaming from drone to the base station without experienced any delays. Initial results from the numerical analysis also show that the camera's specification and the height of the flying drone have a considerable impact on gaining a wider coverage area. In addition, the energy needed to complete the Square flying pattern is lower by 3% compared to the Zigzag flying pattern. Moreover, the 5th Generation Mobile technology has better throughput compared to the 802.11 protocols based on the review. FANETs are also stable regardless of the number of drones' usage. The essential contributions of this research are in identifying the best functional and technical specification in the search and rescue mission that utilise drone. Specifically, the finding significantly contributes to the forensic department of Hospital Kuala Lumpur (HKL) in formulating the guidelines for 48 golden hours victim identification in a remote disaster area.

# ACKNOWLEDGEMENT

Firstly, I wish to thank God for giving me the opportunity to embark on my MSc and for completing this long and challenging journey successfully. My gratitude and thanks go to my supervisor, Assoc. Prof. Ir. Dr. Yusnani Mohd Yussoff. I have been amazingly fortunate to have an advisor who gave me the freedom to explore by myself and at the same time the guidance to recover when I steps faltered. She taught me how to question thoughts and express ideas. Her patience and support helped me overcome many crises and finishes this thesis. Without her, I may not be able to complete this research correctly.

This research would not have been possible without the support of many people. Many thanks to my co-supervisor, Assoc. Prof. Ts. Dr. Murizah Kassim and the leader of this research grant, Professor Nooritawati Md Tahir, read my numerous revisions and helped clarify the confusion. Also, thanks to project members Dr. Fadhlan, Dr. Norashikin, Nabilah dan Hakimy, who offered guidance and support.

The authors would like to thank the Ministry of Education (MOE) Malaysia for providing the grant 600-IRMI/TRGS 5/3 (001/2019)-1, and the Research Management Centre (RMC) of Universiti Teknologi MARA for supporting this research work.

Most importantly, none of this would have been possible without the love and patience of my family. Without their support and encouragement continuously and consistently throughout the project progression, this research is impossible to complete.

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