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## An expanded square pattern technique in swarm of quadcopters for exploration algorithm (Article)

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### Abstract

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The exploration algorithm is one of the most important roles in the searching mechanism. In robotics field, the exploration algorithm deals with the implementation of the robot to enlarge the information over a particular environment. In other words, the implementation of exploration algorithm into a robot is intended to survey the situation or condition of a specific area. A variety of techniques has been developed, even the biological systems also become an inspiration to be reckoned. In this paper, we proposed a swarm-based exploration algorithm with expanded square pattern using a quadcopter to explore an unknown area. In this algorithm, the expanded square pattern is conducted by a series of distance around a fixed reference point. We simulate the swarm-based exploration algorithm with expanded square pattern using a VREP simulator. The existing exploration algorithms that have been identified are also simulated to be compared with the proposed algorithm. In order to analysed and evaluate the performance of all algorithms, the data of simulation is documented. Some comparisons are conducted such as the performance of all algorithms, the performance of a group of the quadcopter, the covered spaces and the cooperation among groups. © 2005 – ongoing JATIT & LLS.

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