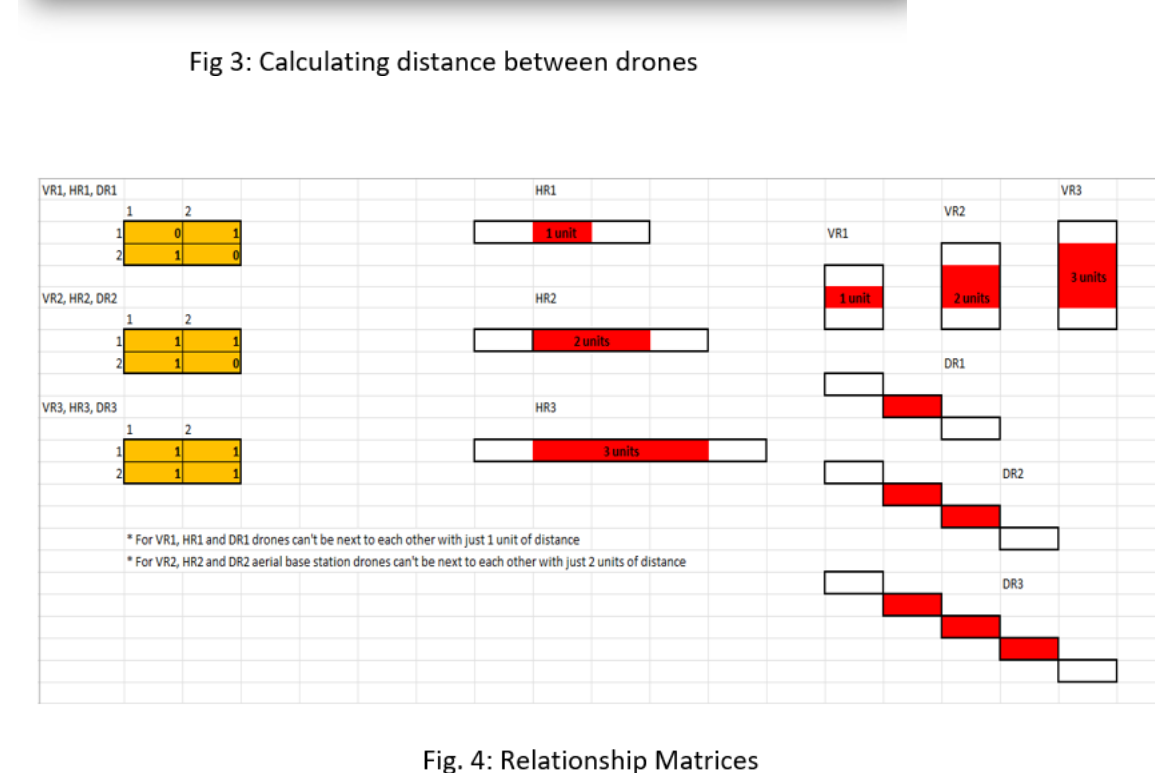
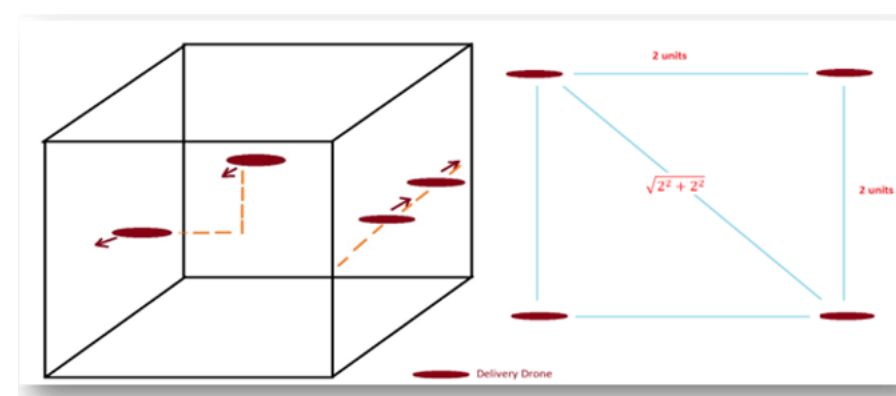
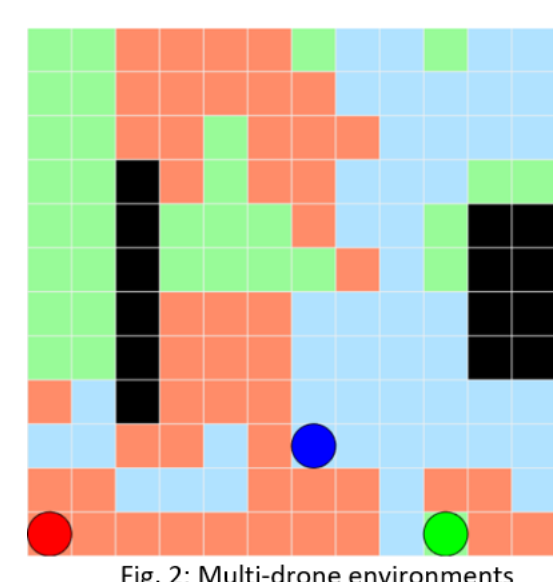
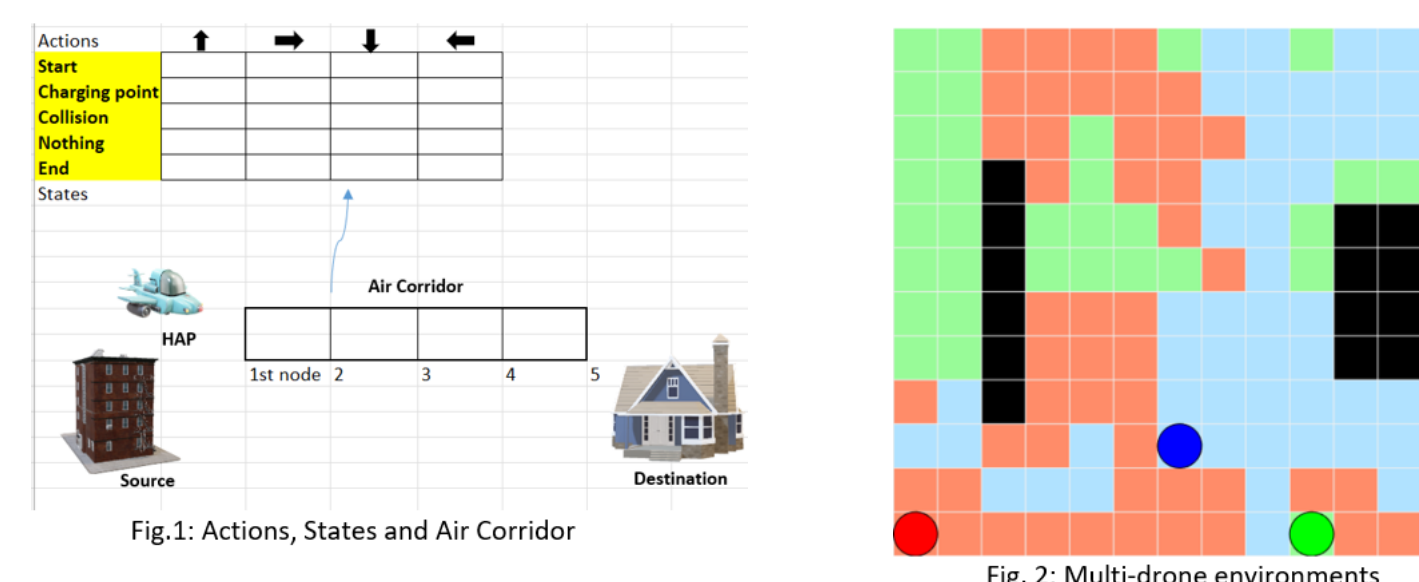


ABSTRACT

This research aims to develop an UAV tracking method in air corridor using RL, GAN and EEG. The problems with UAV's would be huge energy consumption, limited battery life, delivery time and drone collisions with obstacles or with each other. By utilizing the potential of Convolutional Neural Network(CNN) especially RL and GAN, we plan to enhance the capability of UAVs to deliver freight in a faster, energy efficient and safer way. This research also assesses if near real-time performance can be achieved for such an approach using EEG signals. This research idea is useful in many domains like cargo delivery, unmanned driving, medicine delivery, e-commerce.

DESIGN & IMPLEMENTATION

In this research, we used two delivery drones and one aerial base station drone to achieve our aim. Firstly, we defined the drone environment using the action, states, and rewards for both the drones. Next the relationship (Adjacency) matrices was designed to avoid collision of the drones and lastly, developed a logic to calculate the shortest path to successfully deliver the package. We developed some assumptions and constraints to define our environment and reward calculations for the drones.

**CONCLUSION**

This research was successful in developing the required method such as creating drone like environment for drones to travel from source to destination, relationship matrices to avoid drone collision and shortest path calculation. Our future study is to use GAN techniques to train the drones with artificial data and use EEG signals to monitor and control the drone movements in the air corridor.

Reference: <https://www.mathworks.com/help/reinforcement-learning/ug/train-3-agents-for-area-coverage.html>

Our research uses Reinforcement Learning(RL), Generated Adversarial Network(GAN), and Electroencephalogram(EEG) to solve different problems in multi-drone environment. This research idea can be used in domains like package delivery, unmanned driving, wireless communication etc.

Project Link: <https://sites.google.com/view/ehr-it-2022/home>