ABSTRAK

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DESAIN DAN IMPLEMENTASI *PATH FOLLOWING DRONE*

(xiii + 46 halaman; 22 gambar; 3 tabel; 5 lampiran)

Dalam proyek Tugas Akhir ini dilakukan percobaan dimana *Drone* dirancang dapat bergerak sendiri dan dapat bergerak sesuai dengan jalur yang sudah diberikan. *Drone* bergerak mengikuti jalur yang sudah ditentukan dalam program secara *offline*. Aplikasi yang digunakan adalah Sublime sebagai *text editor* untuk menulis program, dan Node.js digunakan untuk mengirim program dari komputer ke *Drone*.

Tugas Akhir ini penulis menggunakan Parrot AR. *Drone* 2.0. *Drone* tersebut memiliki *wifi* sendiri yang biasanya digunakan untuk mengendalikan melalui *smartphone* dengan aplikasi AR. FreeFlight, tetapi *wifi Drone* akan digunakan sebagai perantara untuk mengirim program ke *Drone*. *Drone* akan memancarkan *wifi Drone*, dan komputer harus terkoneksi dengan *wifi Drone*. Pemograman menggunakan bahasa JavaScript dan menggunakan *library* ar-drone. *Library* ar-drone didapat setelah meng*install* Node.js melalui *command prompt*. Node.js digunakan untuk mengirim program dengan *wifi Drone*. Setelah terkirim, *Drone* akan bergerak sesuai perintah program yang sudah terkirim.

Pengujian *Drone* terdiri dari 3 tipe percobaan dan setiap tipe percobaan diambil 5 kali percobaan. Tipe pertama, *Drone* bergerak di luar ruangan ke arah tiga titik yang berbentuk segitiga sama kaki dan mendarat di titik akhir. Tipe kedua, *Drone* bergerak di luar ruangan ke arah tiga titik yang berbentuk segitiga sama kaki dan akan mendarat di setiap titik. Tipe terakhir, *Drone* akan bergerak di dalam ruangan ke arah tiga titik yang membentuk segitiga sama kaki dan mendarat di tempat semula.

Berdasarkan hasil pengujian, *Drone* belum dapat membentuk segitiga sesuai plot, dikarenakan tidak adanya *feedback* untuk tetap mengikuti jalur yang diberikan. Karena tidak adanya *feedback*, maka *Drone* tidak dapat mendeteksi posisi dan orientasi setiap saat. Sehingga jika ada kesalahan posisi dan orientasi yang disebabkan oleh faktor luar seperti angin, maka *Drone* belum mampu melakukan perbaikan posisi, namun *Drone* sudah dapat membentuk segitiga.

Referensi : 11 (1967 – 2017)
Keywords: Drone, JavaScript, *Path Following*.

ABSTRACT

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DESAIGN AND IMPLEMENTATION PATH FOLLOWING DRONE

(xiii + 46 pages; 22 images; 3 table; 5 attachment)

This final project, is a research where a drone will be designed to move independently. Drone will move on a path as instructed on its program. The application used to design the drone is Sublime to write the program, and Node.js to send the path instruction program from computer to drone.

This final project will use Parrot AR. Drone 2.0, which has its own Wi-Fi to be remotely controlled from smartphone with an AR application, FreeFlight. In this final project, instead of using the Wi-Fi as a remote control, computer will be used to send a path instruction program. A computer must be connected to the drone's Wi-Fi to send the program. The program will be written in JavaScript with ar-drone library. Ar-drone library can be installed from Node.js via command prompt. Node.js will be used to send the program to drone from the drone Wi-Fi. Drone will act as the program instructed after the program has been received by drone.

The Drone testing consists of three types of trials. Each type is tested five times. The first is drone to move in an outdoor environment in three points to representing an isosceles triangle, the drone will move to each point and land on the third point. The second is drone to move in an outdoor environment in three points to representing an isosceles triangle, and the drone will have to land on each point. The third will have the drone move in an indoor environment in three points to represents an isosceles triangle, the drone will move to each point and land on the third point.

Based on the result, the drone is not yet able follow the path of an isosceles triangle as the points represents as the drone did not have any feedback to keep its stability. As the drone is lacking feedback, it cannot detect its current position and orientation at all time. As an example, if drone happens to be in the wrong position or loses its orientation because of outside factor like wind, then drone will not be able to reposition itself, but the path still forms a triangle.

Reference: 11 (1967 – 2017)
Keywords: Drone, JavaScript, Path Following.