

# Development of Automation Navigation System of Unmanned Aerial Vehicle with Chua's Chaotic Model

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**Abstract** - The actual performance of Automatic Unmanned Aerial Vehicle for searching target in broad topography may cause the coverage aviation and immediately find target problems. In the past research, it had accepted that chaotic random number generation for being the signal of robots control; the robots could be unrepeated motion which is better than random control signal. This research is the study of chaotic signal for controlling the aviation direction of automatic UAV with complex parameters of UAV body whether speed, maximum turning angle, or Lateral Guidance Control Law of UAV itself. This research has simulated aviation into computer program according to aviation control planning law of UAV and has used chaotic signal as the aviation direction controller for possibility in application of coverage aviation in limited area and searching target within limited time and has been guided on the actual performance.

**Keywords** - Unmanned Aerial Vehicle, Chaotic Model

## I. INTRODUCTION

The past research had proved that robot motion that directed by such chaotic signal, covered area better than used of random control signal. [1] However, there were multiple chaotic control signals. [2] From the past research, [3] robot pathway with Chua's Chaotic Model could more control pathway

than other chaotic control signals. So this research uses control signal from the equation of Chua as the control signal.

Equation of Chua

$$\begin{aligned}\frac{dx}{dt} &= a(y - x - j(x)) \\ \frac{dy}{dt} &= b(x - y + z) \\ \frac{dz}{dt} &= -cy\end{aligned}\tag{1.1}$$

Where

$$f(x) = m_1x + 0.5(m_0 - m_1)(|x + 1| - |x - 1|)$$

And

$$\begin{aligned}x_0 = 0.1, y_0 = 0.1, z_0 = 0.1, a = 15.6, b = 1, c = 25.58, \\ m_0 = -8/7, m_1 = -5/7\end{aligned}$$

and Chua's Chaotic Model as shown in fig. 1.