**Design and implementation of a new lightweight chaos-based cryptosystem to secure IoT communications.**

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**My Work:** Lorenz system is used for random generator part in this paper. Below is the equation:

Dynamical System: One or more variables that change over time according to autonomous differential equations.

Phase Space: Cartesian space. Each point in the space is a unique state of the system, and has its own rate of change which can be shown as a vector.

Attractor: Set of points in the phase space which attracts all the trajectories in an area surrounding it – the basin of attraction.

1. Fixed point attractor
2. Limit cycle attractor – Van der pol oscillator.

Strange Attractor: It has a fractal structure. For Lorenz system it is 2.06.

Difference for different initial conditions:

Dt = D0eᵡt

ᵡ = Lyapunov exponent ;

Positive = Difference between trajectories increases exponentially.

Zero = Difference remains constant

Negative = Difference comes becomes zero eventually.

It is measured by simulation, keeping track of many trajectories.

It provides how chaotic a system is.

For Lorenz system, it is 0.9

**Future Plan:** Learn more detail about Lonrenz system and mathematics related to it.