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

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**Recap:** Previously I read and grasped most of the contents of the entire paper. Learnt about proposed cryptosystem in detail to understand the said encryption and decryption process.

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

Here a, b and c are the system parameters and x0, y0 and z0 are the initial conditions. Runge-Kutta method is used to solve this equation. It is simulated in MATLAB tool.

* X and Y outputs of random generator are used for permutation and xor blocks.
* These value are converted from float to binary using IEEE754 standard.
* The keys are constructed using the least significant bits (LSBs) of the fractional part of X and Y of the chaotic generator because of their rich dynamics.
* If a generator can produce more than 2100 different key combinations, then it is considered unbreakable against brute-force attack.
* Here the generated key depends on 6 values: three initial conditions (x0, y0, and z0) and three parameters (a, b, and c).
* Each value is encoded on 32 bits. Therefore, the key space is 232×232×232×232×232×232 = 2192 ≥ 2100.
* This value is far above the required keyspace making this scheme robust against brute force attacks.

**Future Plan:** Learn more detail about Lonrenz system and also simulate it in MATLAB tool. Unmodified Lorenz system will be used to be simulated.