

Project topic: Information Engine

Date: 4/27/2022

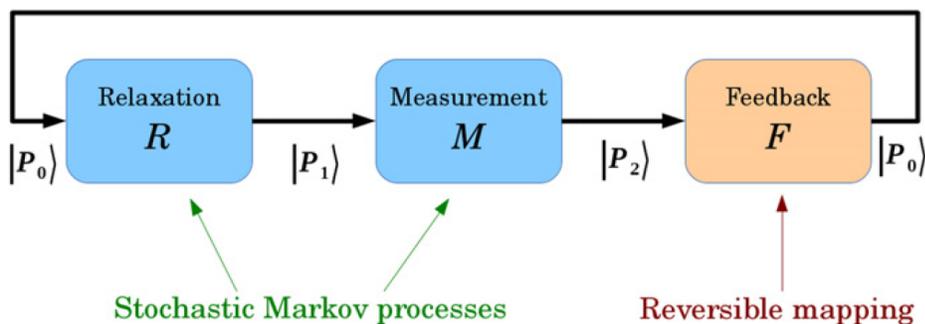
A. Goal

In this project, I would like to learn the theory and implementation of information engines, what is the cost of running an information engine and also the upper bound of the achievable work. The concept of using information to harvest energy is a new concept to me and therefore I choose this as my project topic.

B. The dynamical system

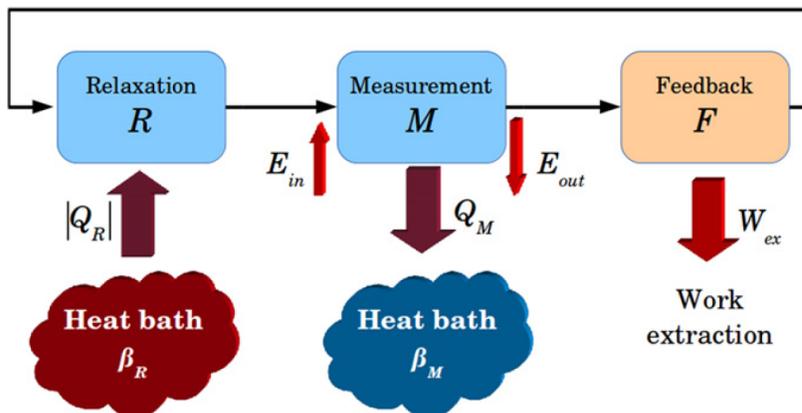
a) state space

One type of information engine is based on a feedback mechanism. The following diagram describes the cycle of the engine. The system has two states, 0 and 1. Also, the memory has two states, 0 and 1 too. The state space is a product of the system and the memory.



b) Dynamics of the system

The dynamic is shown as in the following diagram. At the beginning, the system is in relaxation. The heat bath provides thermal fluctuation and set the system state to be 0 or 1. The state of the system is measured and the data is written to the memory. In the feedback process, work is extracted according to the state of the system.



C. Steps for the investigation:

1. Read literature and understand more on the theory of information engines, its implementations.	2 weeks
2. Summarize the information and write up reports.	1 weeks