

# Memory capacity of RNN in reservoir computing

**Background:** One of the essential topics in computational neuroscience is to borrow the properties of brain to develop so-called brain-inspired or neuromorphic computations, which is regarded as a potential road to next generation of artificial intelligence. On the other hand, these types of work might, in return, provide answers towards the capability of general intelligence of biological brains. The Echo-State Network, introduced by [Jaeger et al \(2004\)](#), provides a suitable framework for brain-inspired computation, which is also known as Reservoir Computing (RC). It's a special types of recurrent neural network (RNN), which is commonly regarded as an easy-trainable and relatively robust universal approximator of dynamical system. In this project, we ask: what advantages does the brain connectome have to for their learning and memory capability? Here, we mainly tackle on the memory capacity of the reservoir network as functions of their architectures. Does it help by introducing biological connectome? And how?

**Project setups:** We provide the basic framework of reservoir computing, and biological brain connectome for tests. [Jupyter Notebook demo]

**Project map:** The project core is covered by 1-5; subsequent questions can be taken in any order.

