Imitation Learning for Intelligent Water Release

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Background and Motivation

Our project is motivated by the water release of reservoirs problem in America. How to control the water release of reservoirs has become an important problem. It is inefficient and time-demanding to control by human and we would like to find an intelligent agent that can help us make decisions.
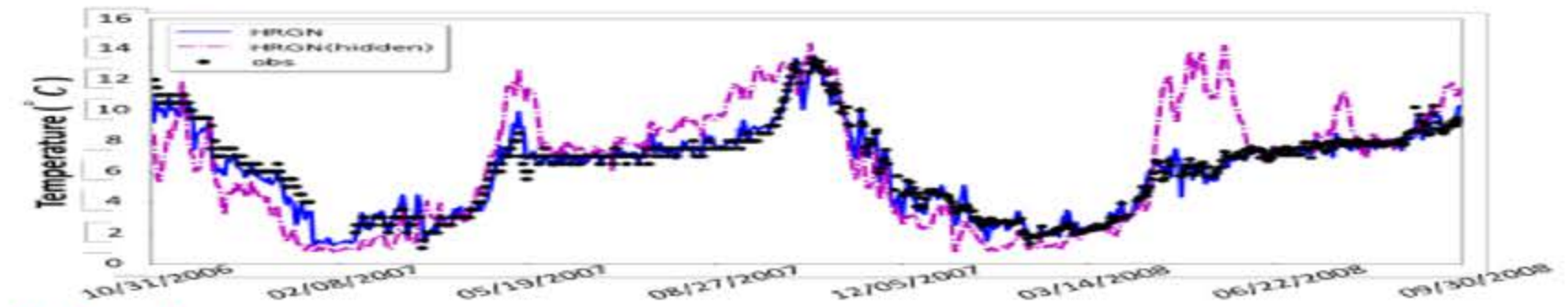

Challenges

- Sparse and imbalanced data
- Unknown transition state of the environment

Objective

- Simulation: Accurate prediction of stream water temperature
- Learning: When and how to release water given whether state

Dataset

➢ Climate drivers

The observation of whether, including temperature, humid, etc.

➢ Information about water release

The observation of water release, including type and volume

➢ Network structure

The distribution of rivers and reservoirs

➢ Temperature of rivers

Proposed method

1. Simulation
    - ➢ Supervised learning
    - ➢ Seq2seq LSTM (Long Short Term Memory)
2. Leaning
    - ➢ Inverse Reinforcement Learning (Imitation learning)
3. Sparse Data
    - ➢ Generative Adversarial Data Interpolation

Acknowledgement