CS5658 Anomaly Detection Homework4 – Video AD

Due Date: 5/28 23:30

Update Date: 5/18

Update Date: 5/21

Avenue dataset

Avenue Dataset contains 16 training and 21 testing video clips. The videos are captured in CUHK campus avenue with 30652 (15328 training, 15324 testing) frames in total. The training videos capture normal situations. Testing videos include both normal and abnormal events. Three abnormal samples are shown as follows.
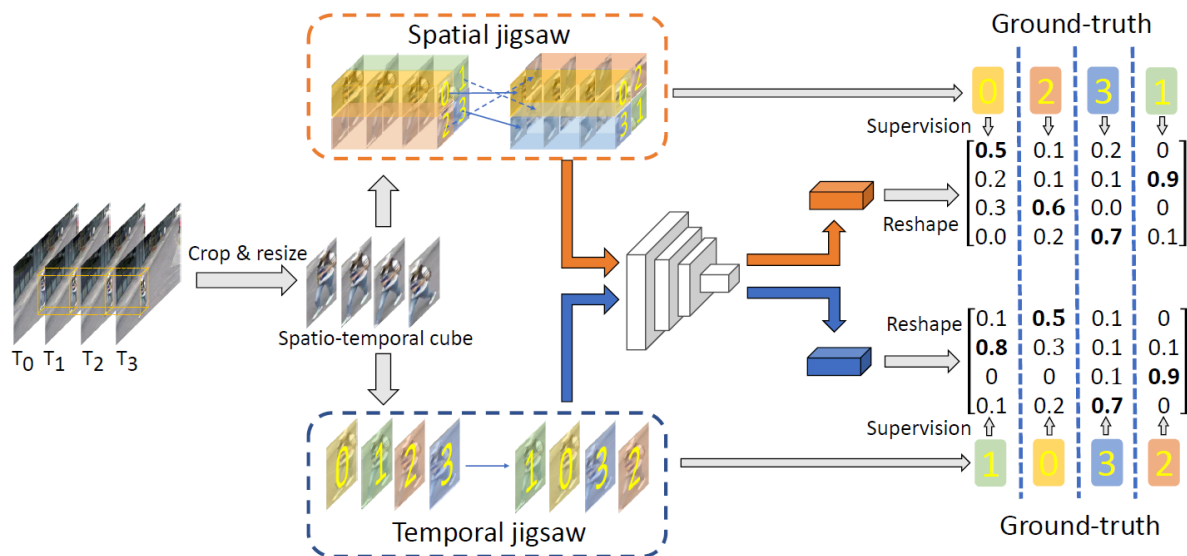

Reference: https://www.cse.cuhk.edu.hk/leojia/projects/detectabnormal/dataset.html
Download link (well-formatted version):
https://drive.google.com/file/d/1LGAkgoqu5AQJzkqpR8s8R97xbXK5S9Mq/view

In this task, we are going to apply Jigsa-VAD (ECCV, 2022) for video anomaly detection.

Reference: https://github.com/gdwang08/Jigsaw-VAD

The experiment settings are as follows:
1) We use **5 frames** as a single spatio-temperal cube.
2) We use videos **01-08** in the training set, and **01-05** in the testing set.
3) We set the **filter_ratio=0.9**.
4) We set the **epoch=20**.

Problem 1

Use the above setting, train the model and evaluate it on the testing set. Record your micro-AUROC.

Problem 2

Modify the **temporal** permutation prediction as a binary classification (normal/abnormal) **and preserve the paper version of spatial permutation**. Here we define normal as a frame sequence without permutation, and abnormal as a frame sequence with permutation. You need to set the normal:abnormal ratio to 1:1 in the training stage. The anomaly score is defined as the probability of being an anomaly sequence. Record your micro-AUROC.

Problem 3

Modify the **temporal** permutation prediction as a permutation classification **and preserve the paper version of spatial permutation**.

For example:
      Permutation #1: 01234
      Permutation #2: 01243
      Permutation #3: 01324
      …
      Permutation #5!: 43210

Predict permutation probabilities of the 5!=120 kinds of permutations. The anomaly score is defined as **1-Probability of Permutation #1**. Record your micro-AUROC.

Problem 4

Write down your observations based on the three versions.

Note:

You need to submit a single **report.pdf** containing the following things:
1. Problem 1: micro-AUROC
2. Problem 2&3: micro-AUROC, all your code modification with explanation.