O3 Background run
Recap

A. Amplitude is the new black.

B. Big batch size is the cure toward noises

C. The final goal O3 test
Amplitude is the new black

Parameters that are left undetermined for stream data:

- Stride size
- Labeling for data that are include partially

A. Train the model with O3 back ground with 2sec window with different stride size [Injection, No Injection]

B. Test the label output from the model

C. Label the partial injection according to the above data.

D. Then retrain the model and test it’s TPR and FAR
A. Import O3 data from 1,265,590,272 to 1,265,762,304

B. 172,032 sec of background

C. Resample to 4096Hz

D. Two second window, 0.5 sec sliding window.

E. Bandpass(30, 2000)

F. Omit strain noise that has strain amplitude exceeds 5 sigma away from zero
Injection & SNR test

A. The match fitering method produce additional signal that exceed the alert theshold

B. We cut the time to SNR space in two segment

C. The first half gives out the correct signal
A. The plot shows the react of SNR with signal injection

B. The Amp to SNR relation is log scale
A. With the normal for loop to sort the or search the index of the max value will take the time complexity of $O(n^2)$

B. The above sorting method can reduce the time complexity $O(n \log(n))$
Performance

A. Mixed SNR

B. The distance is sampled from uniform distribution

C. The hyper-parameters:
   a. 40K data for each set
   b. 15 epochs
   c. Batch size 512,
Swap Data Set

A. Swap of training and validation sets

B. SNR = 30

C. The distance is sampled according to the Amp Distance relation

D. The hyper-parameters:
   a. 5K data for each set
   b. 15 epochs
   c. Batch size 512,
Summary

A. Match filtering may face critical problem when the noise and signal has similar frequency properties.

B. However, machine learning model may help us to solve problems from other aspects.

C. Once the sorting algorithm is developed, we can have element-wise information of either relation, SNR, Distance, Pol, etc.

D. The data set has been produced with bug.