G2Net

Gravitational Wave Detection

Find gravitational wave signals

from binary black hole collisions

Table of Content

**Aucune entrée de table des matières n'a été trouvée.**

# Introduction

## Story

In this competition you are provided with a training set of time series data containing simulated gravitational wave measurements from a network of 3 gravitational wave interferometers (LIGO Hanford, LIGO Livingston, and Virgo). Each time series contains either detector noise or detector noise plus a simulated gravitational wave signal. The task is to identify when a signal is present in the data (target=1).

The parameters that determine the exact form of a binary black hole waveform are the masses, sky location, distance, black hole spins, binary orientation angle, gravitational wave polarization, time of arrival, and phase at coalescence (merger). These parameters (15 in total) have been randomized according to astrophysically motivated prior distributions and used to generate the simulated signals present in the data, but are not provided as part of the competition data.

## Inventory

**Each data sample (npy file) contains 3 time series (1 for each detector) and each spans 2 sec and is sampled at 2,048 Hz.**

## Workplan

### Objective

### Cropped images

### Code sanity

### Batch Normalisation and activation ordering

### Leaky ReLU as baseline

### Alternate activations functions

# Abstract

## Why

# Summary

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| function | alpha | Validation accuracy | Batch to train | Time to train | Batch time (m:ss) |
| Leaky ReLU (Baseline) | .3 | **.5608** | 32 | 2h59 | **5:59** |
| ReLU | N/A | .4271 | 25 | 2h29 | 5:96 |
| PReLU | N/A | .4192 | 27 | 3h49 | 8:48 |
| ELU | .25 | .5342 | 32 | 4h02 | 7:56 |
| GELU | N/A | .4896 | 32 | 4h24 | 8:25 |
| SELU | N/A | .4567 | 32 | 3h07 | 5:84 |
| SWISH | N/A | .4671 | 32 | 3h27 | 6:46 |

# Conclusions

# Annexes

#### Model evolution attempts

#### Full training test