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Searches for Compact Binary Coalescence Events using Neural Networks in LIGO/Virgo data

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We present results on the search for the coalescence of compact binary mergers using convolutional neural networks and the LIGO/Virgo data. Two-dimensional images in time and frequency are used as input, and three sets of neural networks are trained separately for low mass, high mass and asymmetric mass compact binary coalescence events. We explored neural networks trained with input information from one, two and three interferometeres, indicating that the use of information from more than one interferometers leads to an improved performance. We also explore the possibility of combining the information from the different CNNs to achieve a better discrimination. Time-shifted analysis is used to estimate the background distribution of our statistic and assign a FAR to each one of our triggers. Lastly, a scan over a large sthrech of real data is performed to understand the performance of our method and to compare it with the performance from canonical pipelines.

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