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Neural network time-series classifiers for gravitational-wave searches in single-detector periods

Friday, 12 July 2024 17:40 (20 minutes)

The search for gravitational wave signals in the data collected by the current ground-based interferometers is a complex problem, especially when only one detector operates. Modern deep learning approaches could contribute to find a solution. I'll discuss the detection problem and present the work detailed in https://iopscience.iop.org/article/10.1088/1361-6382/ad40f0 where we investigate the performance of neural network classifiers based on three types of architectures: convolutional neural network, temporal convolutional network, and inception time. The last two architectures are specifically designed to process time-series data. We apply the trained classifiers to LIGO data from the O1 science run, focusing specifically on single-detector times. We find a promising candidate on 2016-01-04 12:24:17 UTC compatible with a black hole merger with masses 50 M⊙ and 24 M⊙.

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Session Classification: Machine learning in astronomy: AGN, transient events, cosmology and others

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