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Applications of Machine Learning in Low-latency LIGO searches for Gravitational Waves[1] KYLE ROSE, Kenyon College, LIGO COLLABORATION — LIGOs search for gravitational wave signals is negatively affected by the presence of transient excitations from non-astrophysical sources, called glitches, in the data. Efficient glitch identification and removal will greatly improve LIGOs ability to detect astrophysical signals. LIGO is exploring the application of various classifiers, including Machine Learning Algorithms (MLAs), to this problem because they have the potential to make accurate predictions about the data (glitch or no glitch) in real-time. Machine Learning Algorithms take in a large set of inputs, called a feature vector. The contents of the feature vector can impact the accuracy of MLAs. LIGO uses a handful of characteristics about glitches in its auxiliary channels (seismic activity, thermal, etc.) to build the feature vector. From this information, the MLA is able to make predictions about when there is a corresponding glitch in the gravitational wave channel. This work demonstrates the effect of adding new features to the feature vector. One of these new features is the elapsed time between the interferometer attaining lock and the auxiliary channel glitch. In this work, the performance of the classifiers with and without the added features is evaluated.

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