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Using Artificial Neural Networks for Glitch Identification in Advanced LIGO DONALD MOFFA, KYLE ROSE, LES WADE, MADDIE WADE, Kenyon College, LIGO, LIGO SCIENTIFIC COLLABORATION COLLABORATION — In an effort to increase sensitivity and produce reliable sensitivity estimates in low-latency, the LIGO collaboration is beginning to incorporate machine learning algorithms into the process of vetting data for glitches. Glitches are transient noise instances that occur frequently in LIGO data. Machine learning algorithms could potentially be used to veto glitchy data in real time, which could improve the chance of confidently detecting gravitational waves with associated electromagnetic counterparts. In this work, we studied the effectiveness of Google’s artificial neural network software package, Tensor Flow, for identifying unclean data segments. Tensor Flow, as implemented, had comparable effectiveness to other machine learning algorithms but showed more robustness to increased feature sets.

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