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Machine Learning for Gravitational Wave: how to classify transient signals in LIGO and Virgo detectors - Elena Cuoco, EGO

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Noise of non-astrophysical origin contaminates science data taken by the Advanced Laser Interferometer Gravitational-wave Observatory and Advanced Virgo gravitational-wave detectors. Characterization of instrumental and environmental noise transients has proven critical in identifying false positives in the first aLIGO observing runs. We investigated new ways to identify and classify signals using Machine Learning techniques. We used unsupervised algorithms for not labeled transient signals and we started using more efficient methods using supervised methods as Deep Learning on labeled training data set. We investigated images classification techniques based on GPU technology, which can be used for pattern recognition. After an introduction of the problem, I'll go through the main algorithm or technical solution which we efficiently used and plan to use.

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