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Low-latency EM-Bright source property inference from GW data

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The detection of the binary neutron star (BNS) merger, GW170817, was the first success story of multi-messenger observations of compact binary mergers. However, while the number of GW events have increased, there have been no joint electromagnetic counterparts detected since. A rapid assessment of properties that could lead to a counterpart is essential to aid time-sensitive follow-up operations, especially robotic telescopes. At minimum, this needs the possibility of a neutron star (NS). Also, the tidal disruption physics is important to determine the remnant matter post merger, the dynamics of which could result in the counterparts. The main challenge, however, is that the binary system parameters such as masses and spins estimated from the real-time, GW template-based searches are often dominated by statistical and systematic errors. Here, I'll present an application of supervised machine learning that was used in the third observing run to correct for and report EM-bright source properties in real-time GW discovery alerts.

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