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Deep learning for clustering of continuous gravitational wave candidates in broad searches BANAFSHEH BEHESHTIPOUR, MARIA ALESSANDRA PAPA, Max Planck Inst for Gravitational Physics in Hannover (AEI) — Searching continuous gravitational waves from unseen objects is computationally expensive and relies on hierarchies of follow-up stages for candidates above a given significance threshold. Clustering is a powerful technique which simplifies these follow-ups and reduces the computational cost by bundling together nearby candidates in a single follow-up. We present deep learning networks that automate the clustering procedure. We implemented two networks, one can identify clusters due to large signals, and one can detect clusters due to much fainter signals. These two networks are complementary and using them in cascade achieves an excellent detection efficiency across a wide range of signal strengths. Also, this method shows a false alarm rate comparable/lower than that of clustering methods currently in use.

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