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Artificial neural network classification of the Fermi-LAT catalog blazars of unknown type and unidentified sources

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In 14 years of operation the *Fermi*-LAT detected more than 7000 γ-ray sources, of which one third are still not associated with counterparts in other wavelengths, and approximately one fifth are associated with blazar of unknown type. We developed a machine learning method based on an artificial neural network trained with multi-wavelength data which we used to classify blazars of unknown type as either BL Lacs or Flat Spectrum Radio Quasars. Then we considered all the possible multi-wavelength counterparts of the unidentified γ-ray sources, and we implemented another neural network to identify which counterpart was the best candidate and to classify the unidentified sources accordingly.

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