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## Analyzing gamma-rays of the Galactic Center with Deep Learning: Dark matter vs pulsars

*Thursday 11 January 2018 17:40 (20 minutes)*

We present a new method to interpret the  $\gamma$ -ray data of our inner Galaxy as measured with the Fermi Large Area Telescope (Fermi LAT). We train and test convolutional neural networks with simulated Fermi-LAT images based on models tuned to real data. We use this method to investigate the origin of an excess emission of GeV  $\gamma$ -rays seen in previous studies. Interpretations of this excess include  $\gamma$  rays created by the annihilation of dark matter particles and  $\gamma$  rays originating from a collection of unresolved point sources, such as millisecond pulsars. Our new method allows precise measurements of the contribution and properties of an unresolved population of  $\gamma$ -ray point sources in the interstellar diffuse emission model. In a follow-up work we will apply this method to real data using an updated list of detected point sources in order to infer properties of the point source population below the Fermi detection threshold in the Galactic Center area.

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