

Particle Identification with Machine Learning

J. C. Ruiz Vargas, R. Cobe, R. Iope, S. F. Novaes, T. R. Tomei

São Paulo Research and Analysis Center - SPRACE, Universidade Estadual Paulista - Unesp

The electromagnetic calorimeter (ECAL) is an important subdetector in the CMS experiment at CERN. This work aims the identification of electrons, photons and pions, by observing the signature of these particles in the barrel section of the ECAL. We use a computer vision approach to deal with the energy distributions, specifically, we solve a supervised classification problem with three targets. Our classification model is based upon one of the most effective machine learning algorithms nowadays: the Convolutional Neural Networks. Regarding the software implementation, we take advantage of Google's open source machine learning framework, TensorFlow^a.

^a<https://www.tensorflow.org>