TMVA Exercise

Goal: To gain some familiarity with TMVA and add a basic feature. We will gauge the results of this exercise to assess your coding experience. For general TMVA projects, please complete exercise 3A. For the TMVA-Jupyter notebooks project please complete 3B.

Step 1: Installation

A. Download and build ROOT from http://root.cern.ch/git/root.git (use git clone and tag v6-07-04) following http://root.cern.ch/building-root
B. Use pip3 to install JUPYTER http://jupyter.readthedocs.org/en/latest/install.html

Step 2: Run Jupyter Notebook with TMVA

A. Get notebook http://cern.ch/sergei/ROOTbooks-TMVA GSoC.ipynb and dataset http://cern.ch/sergei/mydataset.root
B. Run it with root --notebook
C. You will see a plot of the receiver operating characteristic (ROC) curve for this dataset

Step 3A: Receiver Operating Characteristic Curve Plots

Extend the current TMVA::Factory functionality to plot ROC curves for multiple datasets using information contained in TMVA::ROCCurve::GetROCIntegral

Hint: you should get a plot similar to http://cern.ch/sergei/ROC.png made with TMVA::Gui based on another class. Instead we would like you to use information in GetROCIntegral to build your own ROC curve. For plotting (x,y) points use TGraph https://root.cern.ch/doc/master/classTGraph.html

Example usage: TCanvas *c=factory->ROCCurve("datasetname");

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c->Draw();
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Step 3B: Jupyter-TMVA specific exercise

> After completing step 2, notice that the plot is displayed inline as a static image. Please implement its Javascript visualization by writing a python function that gets necessary information from TMVA (if you completed step 3A you can use the same ROC plot, or make a simple Gaussian plot yourself). Then use a JavaScript library of your choice to produce a JavaScript version and embed it in the output of the cell using Jupyter machinery.

Once you complete this exercise please send us by email* your results including:

a) your notebook with saved outputs

b) for 3A your c++ code
*email: sergei@cern.ch and lorenzo.moneta@cern.ch

c) for 3B your python function *email: sergei@cern.ch and etejedor@cern.ch