Project VIPER

The intention of this package is to provide examples of how to work with the IT code in python and ROOT. The scripts are not well maintained and will degrade with time. Use at your own risk. I also put some fragments of python for useful tasks.

Nota Bene

- wikimat is anti-python and therefore changed the names of all the scripts from xxx.py to xxx.py.txt
- Useful how to guides and some scripts can be found here

ST performances (LHCb-INT-2014-015)

All the scripts needed to reproduce these results can be found here. README files are available for further technical details.

Tracker vertical alignment (LHCb-INT-2014-016)

All the scripts needed to reproduce these results can be found here. README files are available for further technical details.

Example Python Scripts

Script	Purpose	Comments
itDet_example.py.txt	Using the IT detector element	
ttDet_example.py.txt	Using the TT detector element	
names_example.py.txt	Channels to strings with IT/TTNames	
dq_example.py.txt	Running the piquet DQ algorithm	
decoding_example.py.txt	Running the IT decoding	
ttChargeCalib_example.py.txt	TT charge calibration	Needs ttcal.txt, Needs pretty.xsl
chargeCalib_example.py.txt	IT charge calibration	Needs itcalib.txt , Needs pretty.xsl
magnetProbe.py.txt	Example of getting the magnetic field	
fitit.py.txt	Example of getting tracks in the IT and making a refit	
occ_example.py.txt	Example of making the IT/TT occupancy plots	Macros to analyse output available below
fitit.py.txt	Example of dumping the IT/TT geometry	
fitit.py.txt	Running the STPerformanceMonitor	
status.py.txt	Writing out the ST status conditions	Needs pretty.xsl
maskBeetle.py.txt	Disabling a Beetle	Needs pretty.xsl
lazarus.py.txt	Flipping state of set of Beetles	Needs pretty.xsl
killVCSELs.py.txt	Killing set of VCSELs	Needs pretty.xsl

Python Fragments

Configuring the position tool via python

```
# early data
from STTools import STOfflineConf
STOfflineConf.EarlyDataConf().configureTools()
```

```
# default conf
from STTools import STOfflineConf
STOfflineConf.DefaultConf().configureTools()
```

Filtering clusters on status of Beetles

```
# configure an IT cluster killer
itLiteKiller = STLiteClusterKiller('ITLiteKiller')
itLiteKiller.DetType = "IT"
itLiteKiller.SelectorType = "STSelectChannelIDByStatus"

itLiteKillerTool = STSelectChannelIDByStatus("ToolSvc.ITLiteKiller")
itLiteKillerTool.DetType = "IT"
itLiteKillerTool.allowedStatus = ["ReadoutProblems"]
```

Filtering clusters on S/N

Plug this after the ST clusters have been created (either by the RawBankToSTClusterAlg or the STClusterCreator):

```
# configure an IT cluster killer
itClusterKiller = STClusterKiller('ITKillerAlg')
itClusterKiller.DetType = "IT"
itClusterKiller.SelectorType = "STSelectBySN"
itKillerTool = STSelectBySN('ToolSvc.ITKiller')
itKillerTool.minSN = 0
itKillerTool.maxSN = 5
itKillerTool.DetType = "IT"
```

Clusters failing the criteria will be deleted from the container

Using rootlogon in pyROOT

```
import ROOT, os
ROOT.gROOT.Macro( os.path.expanduser( '~/rootlogon.C' ) )
```

Accessing methods in a base class

In the C++ I have a DeTTDetector that derives from DeSTDetector, I want to use a method findSector that is a member of DeSTSector. Unfortunately in the derived class there is a method with the same name but different signature which python has difficultly with. To work around

```
TT   = det['/dd/Structure/LHCb/BeforeMagnetRegion/TT']
sec = TT.__class__.__bases__[0].findSector(TT,stid)
```

Alternatively:

```
TT   = det['/dd/Structure/LHCb/BeforeMagnetRegion/TT']
TT_base = super( TT.__class__, TT )
sec = TT_base.findSector( stid )
```

Example ROOT macros

Occupancy related

Manipulate histograms made by ITClusterOccupancy, TTClusterOccupancy etc

nclus.C	Compare # of clusters in data/MC	MC reference histograms , Data reference histograms
occanalysis.C	Making IT/TT occupancy plot for layer	MC reference histograms , Data reference histograms
itoccall.C	Making a ps of IT occupancy maps in data and MC	MC reference histograms , [https://twiki.cern.ch/twiki/pub/LHCb/LHCbSTViper/datafile.root][Data reference histograms]] , Example output

Resolution related

Manipulate histograms made by ITTrackMonitor, TTTrackMonitor etc

biasplot.C	IT sector bias plots	Example root file
resplot.C	IT sector resolution plots	Example root file
ttbias.C	TT sector bias plots	Example root file
ttres.C	TT sector resolution plots	Example root file

Performance

plotITA.C	IT Status versus time [June 2010]
plotTTA.C	TT Status versus time [June 2010]

Manipulate histograms made by STPerformanceMonitor

itactiveplot.C	IT Status	perf.root
ttactiveplot.C	TT Status	perf.root

-- MatthewNeedham - 22-Apr-2010

This topic: LHCb > LHCbSTViper
Topic revision: r23 - 2014-07-04 - FredericDupertuis