

Benchmarking

Pulling, compiling, reconstruction
& monitoring

Introduction

- Need to control updates of shoe
 - Check compilation issues (errors/warnings)
 - Check reconstruction issues (segmentations)
 - Check the outputs of reconstruction
- ➡ Night build:
 - Pulling the last version of shoe
 - Compiling shoe
 - Reconstruction for a set of raw/MC data
 - Comparing selected output plots with reference ones
 - Saving information in a log file
 - Checking log file

Scripts

- Scripts under Reconstruction/level0/macros (nightbuild(_ui10).csh.cmake)
 - Pull last version
 - Build last version
 - Run raw data reconstruction
 - Compare to raw data reference plots
 - Run MC data reconstruction
 - Compare to MC data reference plots

Reconstruction

- Run raw data reconstruction:
 - DecodeGlb -in \$FOOTRAWDATA/data_test.00004306.physics_foot.daq.RAW._lb0000._FOOT-RCD._0001.data -out runGSI2021_4306_Plots_1kEvts.root -nev 1000 -exp GSI2021 -run 4306
 - FOOTRAWDATA: location of raw data files
- MC raw data reconstruction:
 - DecodeGlb -in \$FOOTMCDATA/GSI2021/16O_C_400_1_shoereg.root -out runGSI2021_MC_400_Plots_1kEvts.root -nev 1000 -exp GSI2021_MC -run 400 -mc
 - FOOTMCDATA: location of MC data files
- ➡ Reconstruction: 16O @ 400MeV on C target
 - Raw data from GSI2021 campaign, run 4306
 - MC data from GSI2021_MC campaign, run 400

Comparison (i)

- Comparing
 - Reference plots under Reconstruction/data
 - runGSI2021_4306_RefPlots_1kEvts.root for raw data
 - runGSI2021_MC_400_RefPlots_1kEvts.root for MC data
- Running TestBenchMark.C macro

Comparison (ii)

- Macro: TestBenchMark.C
 - Implementation :

```
const Float_t sigma = 0.68;
std::map<TString, TString> mapName = {"VT", "vtClusPixelTot"}, {"MSD", "msClusStripTot"};

// main
void TestBenchMark(Bool_t rawData = true)
{
    TString nameRef;
    TString name;

    if (rawData) {
        nameRef = "./data/runGSI2021_4306_RefPlots_1kEvts.root";
        name = "runGSI2021_4306_Plots_1kEvts.root";
    } else {
        nameRef = "./data/runGSI2021_MC_400_RefPlots_1kEvts.root";
        name = "runGSI2021_MC_400_Plots_1kEvts.root";
    }

    TFile *fRefPlots = new TFile(nameRef.Data());
    TFile *fPlots = new TFile(name.Data());

    for (auto const& it : mapName) {
        TString nameHist = Form("%s/%s", it.first.Data(), it.second.Data());
        TH1F* hPixTotRef = (TH1F*)fRefPlots->Get(nameHist.Data());
        TH1F* hPixTot = (TH1F*)fPlots->Get(nameHist.Data());

        printf("PValue for detector %s:\n", it.first.Data());

        Float_t PValue = hPixTotRef->Chi2Test(hPixTot, "UU P");

        if (PValue < sigma) printf("Cluster distribution changes for detector %s\n", it.first.Data());
    }
}
```

Map for ref plots

Retrieving root files

Comparing plot

Checking Value

Comparison (iii)

- Macro: TestBenchMark.C (ii)
 - Output:

```
Processing TestBenchMark.C+(0)...  
Info in <TH1F::Chi2TestX>: There is a bin in h1 with less than 1 event.  
  
Info in <TH1F::Chi2TestX>: There is a bin in h2 with less than 1 event.  
  
PValue for detector MSD:  
Chi2 = 0.000000, Prob = 1, NDF = 5, igood = 0  
PValue for detector VT:  
Chi2 = 18.498116, Prob = 0.999747, NDF = 44, igood = 3
```


Execution

- Using crontab
 - Store key at git server: `git config --global credential.helper store`
 - `crontab -e`

```
30 23 * * * cd /Users/cfinck/Hadron/F00T/build/Reconstruction/level0 && ./nightbuild.csh >> nightbuild.log 2>&1
```

- Produce a log file `nightbuild.log` (keep previous one `nightbuild.old`)
 - Checking file
- ➡ Send message to a list of persons (ongoing)

Conclusions

- Implemented night build for shoe
 - Discuss other control plots
- ➡ Looking for an alert system