

PWG1 - The Performance Train

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Motivation

- Common effort required to improve detector and track reconstruction performance
- Setup procedure to be run on regular basis
 - data/simulation → reconstruction → analysis
→ QA parameter extraction → validation
- The PWG1 train should be used to validate input for further physics analyses

Definition

- The PWG1 train should have functionality to check detector and track reconstruction performance (QA)
- Example of tasks (cars)
 - Tender (recalibration if needed)
 - Detector reconstruction QA
 - ITS-TPC matching QA
 - V0 reconstruction QA
 - ...

Running conditions

- Run on MC test productions done with current AliRoot version (once a week)
- Run on MC physics production on request (limited statistics)
- Run for each reconstructed cosmic run
- Validation reports
 - CERN offline weekly meetings?

Requirements

- Run regular MC test productions (Pythia MB, Pythia high-pt trigger) on Grid
 - Tagged versions of AliRoot
 - AliRoot release with ported patches
- Run PWG1 train just after reconstruction of MC or real data (separate process)
 - ESDs and ESDfriends available
 - All MC information available
- Register train output files on AliEn

PWG1 structure

- PWG1 is a bit messy. There is no naming convention of PWG1 classes
- Proposal of new structure:
 - PWG1/DET (e.g. PWG1/ITS detector specific tasks)
 - PWG1/global (e.g. global track performance)
 - PWG1/trigger (trigger monitoring tasks)
- Naming convention for new classes:
 - AliDETTaskName (e.g. AliTRDRResolutionMC)
- Should we change names of old classes?

PWG1 train output

- Similar naming convention for the output PWG1 train files is required
- Proposed naming convention:
 - ITS.Performance.root
 - TPC.Performance.root
 - ...
 - V0.Performance.root
- These files should contain histograms/objects which can be merged and analysed to extract QA parameters

Visualization

- Extracted QA parameters/histograms should be visualized
- QA histograms (TH1, TH2)
- Trend graphs generated from ascii files
 - Ascii format syntax (TRD.Performance.txt)
 - "Task_[subTask]_plot value"
 - checkESD_Geo 0.716084
 - checkESD_GeoRMS 0.143415
- Place:
 - <https://twiki.cern.ch/twiki/bin/view/ALICE/PWG1DetectorPerformance>

User Responsibility

- Provide tasks to be run on simulation/real data and AddXXTask.C macro
- Provide functionality to merge and extract QA information
- Define functionality of the tender (if needed)
- Define minimum set of histograms to be visualize on the Wiki
- Regular validation of the QA output (together with experts)

Examples: TPC QA components

- QA performance components (\$ALICE_ROOT/PWG1)
 - AliPerformanceMC (tracking algorithms QA)
 - AliPerformanceRes (TPC track resolution QA)
 - AliPerformanceEff (TPC reconstruction efficiency QA)
 - AliPerformanceDEdx (TPC dEdx detector response QA)
 - AliPerformanceDCA (TPC impact parameters QA)
 - AliPerformanceTPC (general TPC information)
- AliPerformanceTask (\$ALICE_ROOT/PWG1)
 - performance components can be attached to the task and run: locally, on proof, on train (tested on the GSI/QA train)
- QA output histograms (TH1, TH2) are automatically generated and stored in the ROOT folders

Implementation example: AliPerformanceRes

- Track reconstruction resolution w.r.t. MC
 - compares reconstructed track parameters with MC references at DCA, inner and outer TPC wall
- Input (AliESDs, AliESDfriends, Kinematics, TrackRefs)
- Data members (generic histograms)
 - THnSparse(res_y:res_z:res_phi:res_lambda:res_pt:y:z:phi:eta:pt)
 - THnSparse(pull_y:pull_z:pull_snp:pull_tgl:pull_1pt:y:z:snp:tgl:1pt)
- Post-processing by using AliPerformanceRes::Analyse()
 - generate output QA histograms from generic histograms

Support

- CERN offline
 - Run regular MC test productions on GRID (once a week)
 - Tagged versions of AliRoot
 - AliRoot release with ported changes
 - Run PWG1 trains (cosmics / simulation) on GRID
 - cosmics for each reconstructed run (with tender)
 - simulation for test productions and physics productions (limited statistics)
- Contributors to the train
 - Andrea Dainese, Jacek Otwinowski, Marian Ivanov, Alexandru Bercuci, Ana Marin, Juri Belikov, Mikolaj Krzewicki

Outlook

- The PWG1 train should be used to validate input for further physics analyses
- The PWG1 train should start running asap with the highest priority
- Support from CERN offline and ALICE users required

Thanks to: Andrea Dainese, Marian Ivanov,
Alexandru Bercuci, Juri Belikov