OUTLINE for today

- Introduction: Thomas Ruf
- FairSHiP tutorial: Elena Graverini
- TGeo / Geant4 geometry: Annarita Buonaura

OUTLINE for tomorrow

- Production and analysis on SkyGrid: Alexander Baranov (Sasha)
Basics

Software Overview

Structure
Mailing list
- ship-software@cern.ch (SHIP Collaboration mailing list dedicated to software)
- Archive: https://groups.cern.ch/group/ship-software/default.aspx

Web page

Instructions for working at CERN
- http://ship.web.cern.ch/ship/FairShip/computingAtCERN.html

Software repositories
- https://github.com/ShipSoft
  - https://github.com/ShipSoft/FairSoft
  - https://github.com/ShipSoft/FairRoot
  - https://github.com/ShipSoft/FairShip

Installation on afs:
- /afs/cern.ch/sw/ShipSoft

Data repository
- EOS: /eos/ship/data, quota 10TB

Documentation:
- https://trufship@git.cern.ch/reps/shipdocs/
  - or
- https://git.cern.ch/web/shipdocs.git/tree/HEAD:/Public/FairShip
Software Overview

3 Layers

FairSoft
Underlying software: root, Pythia, Geant, ...

FairShip
Detector, Simulation, Reconstruction, Analysis

FairRoot
Light weight Simulation, Reconstruction, Analysis Framework

C++
Python for configuring of C++ objects and execution of non-CPU critical algorithms, user friendly!

https://fairroot.gsi.de/
September 2014 Tutorial
Software Distribution

**GIT**
- Widely used distributed version control system
- Every Git working directory is a full-fledged repository with complete history and full version-tracking capabilities
- Central hub: [https://github.com/ShipSoft](https://github.com/ShipSoft)
- Main commands:
  - `git clone https://github.com/ShipSoft/FairShip.git`: create local copy of FairShip
  - `git pull`: fetch all updates from central hub
  - `git checkout c71af77179224b6d0f7393c69ab257df8b50722c`: specific version
  - If you want to know more: [https://github.com/ShipSoft/FairShip/wiki/Git-Tutorial-for-SHiP](https://github.com/ShipSoft/FairShip/wiki/Git-Tutorial-for-SHiP)

**Software development**
- For the moment, one person (me) doing commits and push
- If you have any changes, additions, etc., please present it in the shipsoft meeting and send me the code.
git checkout

SHAPE experiment framework based on FairRoot http://ship.web.cern.ch/ship/

449 commits
1 branch
1 release
5 contributors

Thomas Ruf authored 10 minutes ago
Latest commit

Merge branch 'master' of https://github.com/ShipSoft/FairShip

Thomas Ruf authored 7 days ago

Commit 468d71dd512407f4b968fe675b6759fede9b1d8e
2 parents 40b6cf4 + 211d4084
Structure

Geometry

- Subdetector directories and passive materials
  - /nutaudet, /veto, /strawtubes, /ecal, /hcal, /muon, /passive

- Also contain
  - Definition which volumes are sensitive
  - What information to store for MC particles entering the volume, momentum, entry/exit points

Global data objects

- shipdata directory
  - shipstack, work space for Geant
  - ShipMCTrack, MC particle object of FairShip

MC Generators

- shipgen directory
- Implemented use cases:
  - HNL signal from charm (beauty): HNLPythia8Generator
  - Muon background: MuonBackGenerator
  - Muon inelastic interactions: MuDISGenerator
  - Neutrino inelastic interactions: GenieGenerator, NuageGenerator
  - Cosmic background: CosmicsGenerator
Structure cont.

## Configuration
- **python directory**
  - shipDet_conf.py, DecaySelection.conf
  - Also some other useful modules: shipunits.py, ShipStyle.py
- **geometry directory**
  - Geometry parameters for ecal and hcal
  - List of materials, media.geo

## Execution
- **macro directory**
- Scripts to run simulation, reconstruction, analysis and eventdisplay
- Accept command line arguments for different use cases
  - run_simScript.py simulation
    - Philosophy: one script for many use cases, instead of many scripts each for one use case.
  - ShipReco.py reconstruction
  - ShipAna.py template for analysis
  - eventdisplay.py visualization of detector geometry and event data
- **genfit directory**
  - External package for track fitting, extrapolation of track states through magnetic field and material
FairSoft/FairRoot/FairShip can easily be installed on your laptop/desktop

- With Linux operating system
- Local installation is preferred solution for running event display