Rivet monthly dev meeting

11 September 2024

Recent activity / TODOs

- **It was August, so… expectation management!**
  - No urgent release plan; 3.1.x "final" whenever *needed*

- **Aspen Center for Physics "Amplitudes to Events" summer programme**
  - Jon, Deepak and Andy present (plus Peter S, Jeppe A, Daniel R, others + PDF & fixed-order)
  - White-paper on uncertainties beyond 7pt-scales being assembled
    - Provided MC/experiment framing about practical necessity of weight-based errs
  - Possible project for use of Rivet and related tools in PDF fitting

- **Publications**
  - Rivet4 release note updated and awaiting resubmission to SciPost Codebases: https://scipost.org/submission/2404.15984v2/
  - YODA paper also needs response to resubmission comments: request for benchmarking attempted, but very hard to compare meaningfully to prior art. Other comments not really about the paper…   **Benchmarking studies ongoing in UCL ARC via CG**

- **GSoC developments**
  - Abhi D ~completed code coverage and multi-arch Docker builds from CI
  - ⇒ **follow-up: test multi-arch Dockers built by Abhi (Chris/Andy)**

Next major feature ideas

- **Improved primary-particle definitions for EIC/ALICE & LLPs (cf. [tools workshop](#))**
  - Requires predicate functions for definitions of primariness
    ⇒ technical issue: std::functions are not comparable… work-arounds? Key to caching
  - Default FS behaviour to move away from get status = 1: semantic change
  - Database for historic $c\tau_0$ tests; particle-specific $c\tau$ or position for BSM LLPs
    ⇒ discuss with *Louie/Sihyun* re. fiducial LLP definitions (also e.g. LHCb) ⇒ AB
  - *Careful* rollout and regression testing needed

- **HI framework and hadron decays**
  - Scatters→Estimates (Leif, Christian B?) ⇒ currently works; could preserve errs, but…
  - Test impact-param and secondary-vertex tools ⇒ LHCb testing
  - HI jet subtraction mechanism?
  - Post-processing script system: auto-discovery and running of fits etc.?

- **Flavour-sensitive kT clustering in LeptonFinder**
  - More prototyping by AB: awkward in vanilla FJ, but QCDAware plugin is ideal. Might want to extend to include charge terms in distance, longer-term — cf. Sherpa.

Meetings, coordination, etc.

- **Requests for CMS / ATLAS / ALICE / FCC / other Rivet & Contur tutorials**
  ⇒ ATLAS cross-group interest, PMG have suggested in **14 Oct ATLAS week** ⇒ **can we?**
  ⇒ Other expts? Alex G to connect interested LHCb people (+ 5 new LHCb analyses)

- **In-person events to meet around**
  - **MIAPbP 2025:** https://www.munich-iapbp.de/activities/activities-2025/event-generators
    - Reg deadline in Oct: coordinate

- **MCnet COST network application by Oct 23 !!**
  - Discussion in Aspen: framing around MC as a central link for precision fixed-order, PDFs, neutrinos, and HI to connect to experiment (and vice versa cf. fiducial lessons)
  - MC performance also a key aspect: all areas report need for sw engineering, esp. FO
  - AB prepping draft application, will be in touch asap — busy few weeks!
    - Registered and draft application created: maybe worth all registering…
    - Need to decide on lead institutes: can't be enormous, have lead national reps
    - Requirement of ~50% "less research-intensive" countries: takes KE seriously

AOB (no change, except HEPData sync)

- **TODO: filtering to show only most-crucial analyses on coverage pages**
  ⇒ maybe? Subjective, risks constructive avoidance of "second class" analyses

- **TODO: add Mac CI runner config in Gitlab CI (via GSoC)**
  (CERN IT don't plan Mac CI runners on the CERN Gitlab in the forseeable future.)

- **Request for ntupling, specifically EDM4HEP format**
  AB wrapper analysis base-class half-written; format of FCCAnalysis not 100% clear. Example requested. EDM4HEP could do with modernisation ⇒ MCnet input

- **HEPData sync update from Rivet**
  Chris G has pushed ~780 analyses' datasets from Rivet to HD storage; Graeme et al to load into db

- **heprivet.org web page (and YODA, LHAPDF…)**
  Needs some imminent person-power to finish. Current developments ongoing (through GSoC and between CG, Max Knobbe and AB for LHAPDF visualisation and data submission). Tech & design for doc/test/coverage data passing can be reused

BACKUP