Formation

Building a Global HEP Software Training Community

Motivation

- O(10k) HEP people worldwide
- We can cover more ground together instead of reinventing the wheel…
- We need software training framework
  - Unified
    - Material and events should be centrally listed & discoverable
    - Concentrate efforts by developing cross-experiment content
    - A community must guide, support, and coordinate
  - Scalable
    - Material must be teachable by multiple instructors
    - Self-study must not be an afterthought
  - Sustainable
    - Material must be open source and maintained collaboratively
    - Incentives & recognition important motivators

The IRIS-HEP/HSF Training group is building a community around these principles

- A unified Training Center for HEP
- Most of our modules embrace the framework of The Carpentries
- Built from markdown files, rendered as a webpage with Jekyll
- Verbose and self-study ready

Training and onboarding initiatives in HEP

HSF Data Analysis Working Group (DAWG) and HSF Training Group hosted [a discussion in summer 2022] (https://indico.cern.ch/event/1175096/

LHCb StarterKit

- 5 days introductory workshop
- emphasizes peer-to-peer instruction

ATLAS software tutorials:

- Interactive, hands-on and project-based structure with the aim of conducting end-to-end physics analysis

CMS Data Analysis Schools (DAS)

- Weeklong schools held 2-3x per year since 2011, with ~50-70 students, 50 facilitators
- Pre-exercises, Lectures, Short Exercises, Long Exercises, Mini-Symposium.

CMS Hands-on Tutorial Sessions (HATS)

- Shifting to Carpentries format to simplify maintenance

Belle II online textbook:

- **focus on self-study** as the primary training mode
- **rst files** rendered with sphinx.

EIC software training

- Online interactive tutorials (recorded) at start of detector proposal development, ~30 users per tutorial per collaboration
- Online interactive sessions at the annual CFNS Summer School, on the Physics of the Electron-Ion Collider, ~30 users per year
- **Regular office hours (up to 3 times per week)**: inexpensive way to support and train users, get early feedback, and do an hour of work if no one shows
- Also developing topical guides for intermediate users to explore additional functionality

DUNE

- Synchronous tutorials are offered 2-3 times per year
- **Using HSF Software Carpentries format**
- Serves a secondary role of allowing new members to form connections
- Dedicated presentation for more details
- Need to expand infrastructure for advanced training in physics specific topics

Common challenges and varied solutions

- Balancing synchronous vs asynchronous training materials
    - Hybrid or self-study or in-person
- Maintaining up-to-date training materials
    - Unit tests or regular updates before tutorials
- Advertising documentation so it's clear where to look for answers to more advanced questions
    - Sphinx vs ReadTheDocs vs Doxygen vs Twikis
- Designing training materials while developing the software stack
- Keeping the training fun and engaging
    - Social events, teamwork, lots of hints and partial solutions

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Remarques personnelles

- Toujours difficile d'avoir des supports utilisables à la fois pour le face-a-face et l'auto-apprentissage.
- Le catalogue du groupe HSF-Training se remplit : beaucoup de supports à réutiliser, mais très héterogènes.
- Est-ce que le cycle "Informatique des deux Infinis" peut rentrer dans le moule ?