



Contribution ID: 362

Type: Oral

Recent developments in histogram libraries

Thursday, November 7, 2019 11:15 AM (15 minutes)

Boost.Histogram, a header-only C++14 library that provides multi-dimensional histograms and profiles, is now available in Boost-1.70. It is extensible, fast, and uses modern C++ features. Using template meta-programming, the most efficient code path for any given configuration is automatically selected. The library includes key features designed for the particle physics community, such as optional under- and overflow bins, weighted increments, reductions, growing axes, thread-safe filling, and memory-efficient counters with high-dynamic range.

Python bindings for Boost.Histogram are being developed in the Scikit-HEP project to provide a fast, easy-to-install package as a backend for other Python libraries and for advanced users to manipulate histograms. Versatile and efficient histogram filling, effective manipulation, multithreading support, and other features make this a powerful tool. This library has also driven package distribution efforts in Scikit-HEP, allowing binary packages hosted on PyPI to be available for a very wide variety of platforms.

Two other libraries fill out the remainder of the Scikit-HEP Python histogramming effort. Aghast is a library designed to provide conversions between different forms of histograms, enabling interaction between histogram libraries, often without an extra copy in memory. This enables a user to make a histogram in one library and then save it in another form, such as saving a Boost.Histogram in ROOT. And Hist is a library providing friendly, analyst-targeted syntax and shortcuts for quick manipulations and fast plotting using these two libraries.

Consider for promotion

Yes

Primary authors: SCHREINER, Henry Fredrick (University of Cincinnati (US)); Dr DEMBINSKI, Hans Peter (Max-Planck-Institute for Nuclear Physics, Heidelberg); PIVARSKI, Jim (Princeton University)

Presenter: SCHREINER, Henry Fredrick (University of Cincinnati (US))

Session Classification: Track 5 – Software Development

Track Classification: Track 5 – Software Development