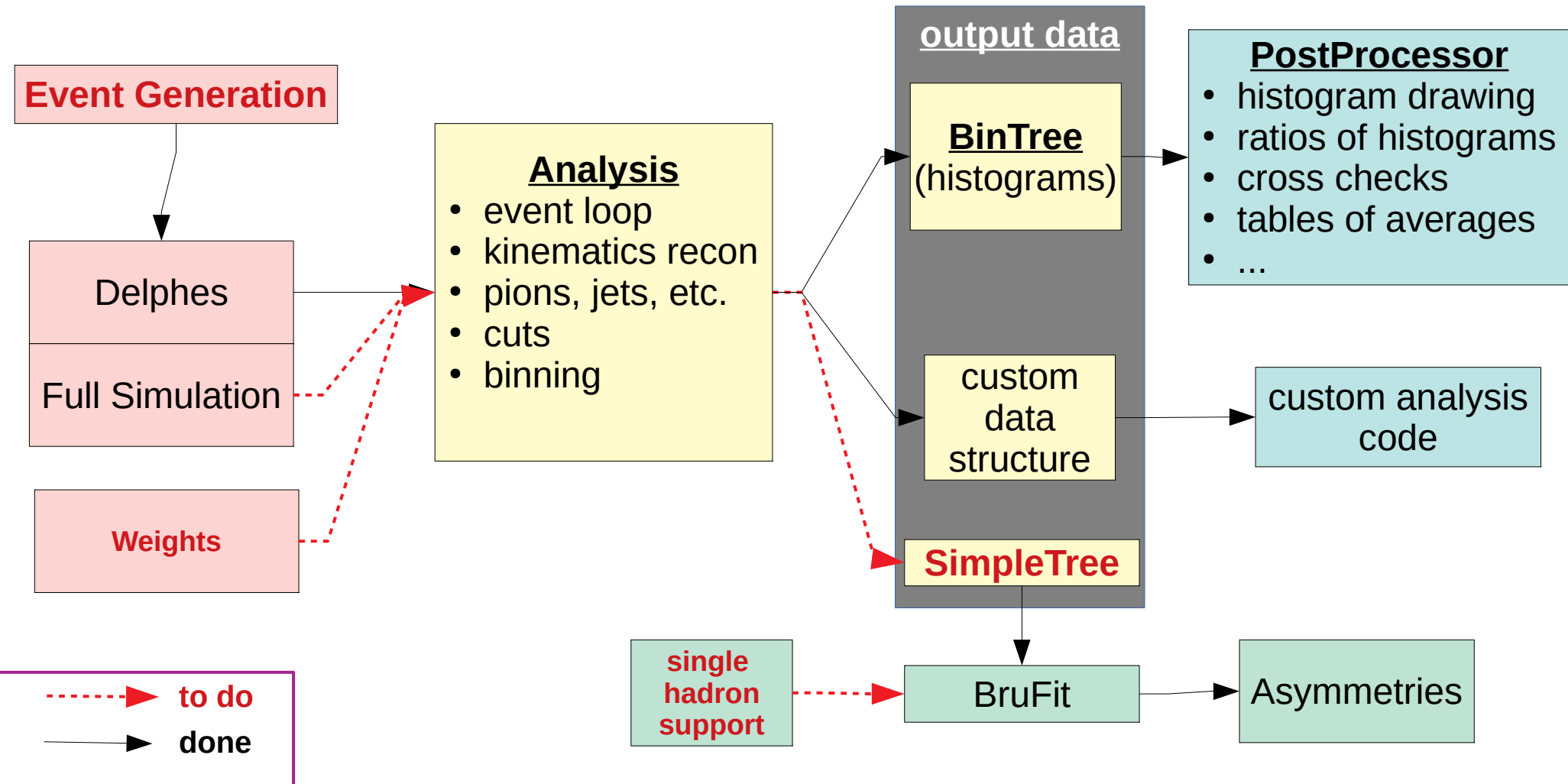


General purpose SIDIS simulation analysis software

<https://github.com/c-dilks/largex-eic>



Current Development Work

- **Sanghwa**: connect full simulation to Analysis
- **Duane**: weights, and consider adding his histograms
- **Connor**: continue working on jets implementation
- **Chris**: build SimpleTree and connect with BruFit; write BinTree class

Contributions

- This repository is in an early stage of development, so bugs and issues are likely
- Contributions are welcome via pull requests and issues reporting; you may also find it useful to fork the repository for your own purposes, so that you do not have to feel limited by existing code (you can still send pull requests from a fork)
- It is recommended to keep up-to-date with developments by browsing the pull requests, issues, and viewing the latest commits by going to the `Insights` tab, and clicking `Network` to show the branch topology

Largex-eic

→ general purpose SIDIS simulation analysis software

- Arbitrary bins, where each bin of some variable x is specified by a CutDef:
 - Range: $a < x < b$ or $|x - a| < b$
 - Minimum: $x > a$
 - Maximum: $x < a$
 - No cut

- 1 BinSet per kinematic variable, holding a list of arbitrarily defined bins, where you can either:
 - Manually define each bin
 - Example (note that overlapping bins is allowed!):
 - Bin 1: full y
 - Bin 2: $y > 0.03$
 - Bin 3: $y > 0.05$
 - Define an axis of bins: N bins between a and b
 - equal widths in linear scale
 - equal widths in logarithmic scale
 - any custom TAxis
 - example: (x, Q^2) bins with equal width in log scale

- User specifies all bins and BinSets at the macro level

- BinTree stores all of the bins in a tree-like data structure (under construction, only a prototype is implemented currently)
 - The path from the top node to a leaf node gives the bin number of each BinSet associated with that leaf (cf. index of a multidimensional array)
 - Each leaf contains a Histos object:
 - Set of user-defined histograms (1,2, or 3D)
 - Set of CutDefs associated with this bin
 - Settings for histograms (e.g., log scale drawing)
 - You are welcome to add your own data structures here too
- No limit to number of BinSets, i.e. dimensions of your binning (current prototype has limits)
 - Careful of the curse of dimensionality
 - Sets of specific bins can be specified by taking only diagonal elements (bins) of the relevant dimensions
- BinSet and Histos are streamable to ROOT files
 - Analyze these with PostProcessor, which can do a variety of tasks:
 - Draw histograms in a specific format
 - Take ratios of histograms from two different bins
 - Dump averages of histograms for a set of bins and make a table
 - Add your own algorithms here
 - PostProcessor is also driven by macros, providing full bin-looping flexibility