OAK RIDGE National Laboratory

Timepix3 data reduction discussion

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U.S. DEPARTMENT OF ENERGY

Current state

- *Computing and UI are intertwined.*
- *The clustering algorithm might have potential issues (more later) .*
- *Too many magical numbers hard coded in the source code, and needs explanation.*
- *There is no verification process for the output.*
- *The raw data parsing (binary → mem) is highly reusable and should be isolated into a separate function.*

Algorithm

- *The algorithm basically requires single processing (not suitable for high throughput via GPU)* → *requires additional investigation to confirm*
- *The computed center maybe order sensitive*
- *Tend to break large clusters into small adjacent clusters* → *a known issue*
  - *There is no merging back step, but it is unclear how critical this side effect is.*
- ~~*The mysterious rotation angle that seems to be moving the center of pixel to senor center (is it necessary?)*~~ → *related to detector mounting, not coding related.*

Proposition

- *Restructure the code via MVP pattern for orthogonal development*
  - *Add plugin systems to allow easy swap for different center calculation method*
  - *Need new termination criteria that is better suited for parallelization (especially on GPU)*
- *Version track source code*
- *Need synthetic data for validation*

Questions

- *What is the time table?*
- *Resources for development?*
  - *Important for setting a realistic scope*
- *Computing resources?*