EMU Trigger Code
Development for ORCA

D. Acosta
University of Florida
Design Philosophy

- **Follow hierarchy of Level-1 hardware**
  - **Processor classes**
    - correspond to electronic boards
  - **Data classes**
    - passed between processors

- **Processors inherit from an abstract base class** *AbsProcessor*
  - Required methods are
    - `run()`
    - `clear()`
  - Pass messages from one processor to the next

- **Each processor has knowledge of other processors only on a “need to know” basis**
  - *MuonSorter* “knows” *SectorProcessor*:
    - Instantiates SP’s
    - Passes `run()` and `clear()` messages to SP’s
    - “Pulls” data forward

- **Full hierarchy of processor tree built in this manner**
Each processor “owns” its data
- Handles new and delete
- Constant reference to vector data passed between processors

Subclasses of processors hidden in the implementation (class within a class)
- e.g. SectorProcessor contains:
  - ExtrapolationUnit
  - TrackAssemblerUnit
  - FinalSelectionUnit
  - AssignmentUnit

The Singleton InterfaceManager handles the exchange of trigger primitives between SectorProcessors (similar to L1MuDTTrig)
- Also it sequences the running of primitive and regional track-finding
Status

- **Standalone skeleton version** of this scheme exists with minimal functionality

- Presently working on the implementation of the **Sector Processor**
  - Will check against Fortran version

- **Trigger primitives** to be fully implemented by **UCLA**

- **Require CSC digis** to be made available in **ORCA** to fully integrate this scheme
Issues

- Extend functionality of **BitArray class**?
  - Extract subset of bits
  - Perform bit operations, subtraction, etc.

- How to read in **look-up table** contents into scheme, so as to match hardware? How is it held in memory?

- **Define interface** to other systems (L1 DT Trigger)

- How to implement **“reconstruction on demand”**?
Documentation

- **L1CSC code can be downloaded from here:**
  - [http://www.phys.ufl.edu/~acosta/oo/door.html](http://www.phys.ufl.edu/~acosta/oo/door.html)

- **Sector Processor archive:**
  - [http://www.phys.ufl.edu/~acosta/cms/trigger.html](http://www.phys.ufl.edu/~acosta/cms/trigger.html)