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Reconstruction Group

Rob Kutschke

LArSoft Steering Group Meeting

March 11, 2016

Original Motivation – From FNAL PAC June 2015

> Fermilab may want to consider creating a forum for exchanging ideas and for aiding progress on LAr event reconstruction. The issue is not just providing a common software platform (this is clearly critical) but also facilitating a forum where scientists (especially young ones) can discuss common issues. Fermilab may want to encourage the major LAr collaborations to consider mechanisms for effective and efficient parallel development and transfer of knowledge.

"Reconstruction" is Broadly Construed

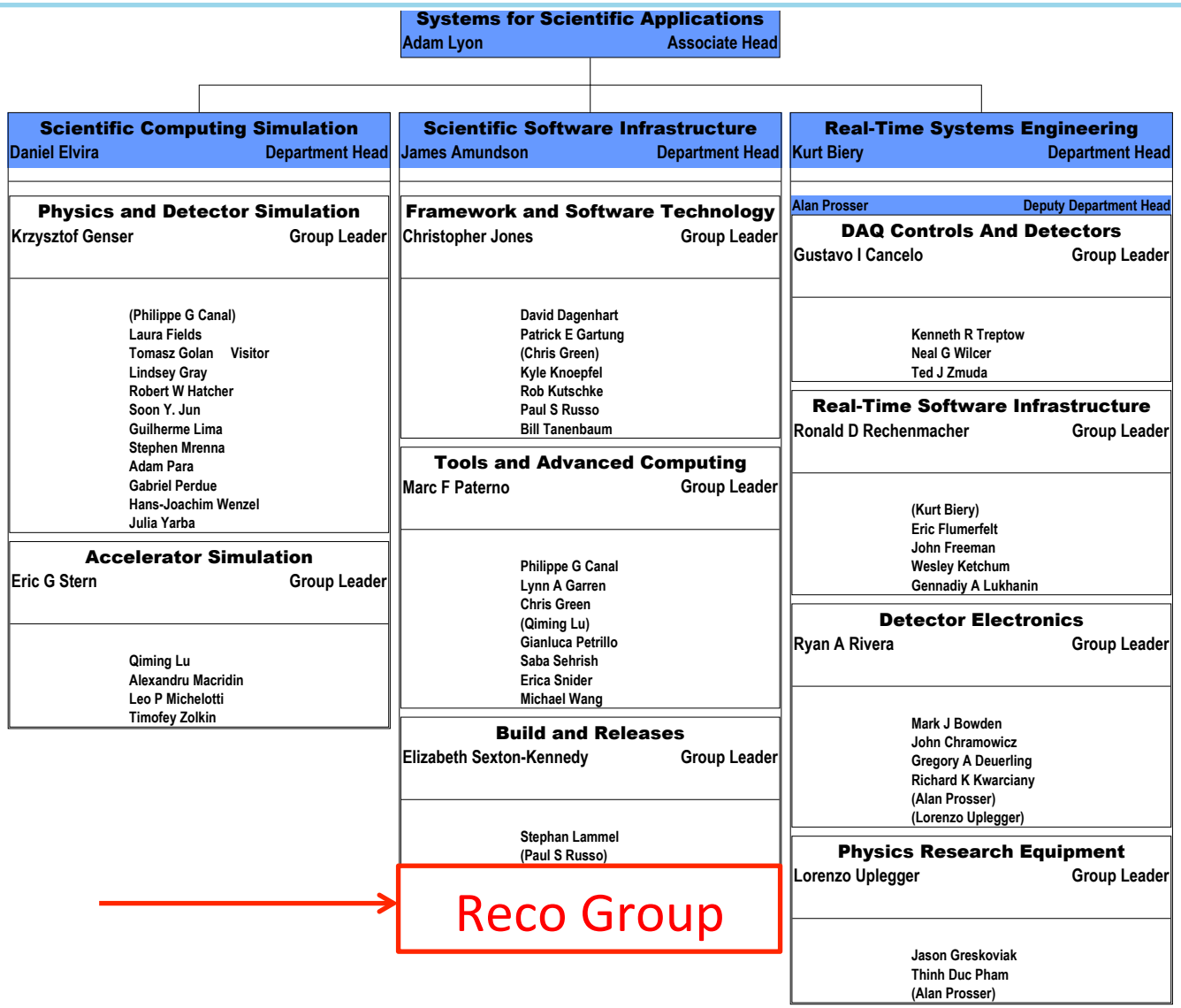
- Finding tracks, showers, vertices …
- Event classification
  - May be a natural use for machine learning?
- Visualization in support of the above
- Concurrency in support of the above
- Use of HPC/HTC in support of the above
- …
- See Adam Lyon's talk: CD-doc-5619

Where possible focus on the similarities of algorithms and techniques with a goal of common libraries for our common platforms.

Two Mandates:

- Assist and augment the efforts of experiments/projects
  - ie respond to requests from them
- Explore new ideas and techniques that may be of value to the experiments

Reconstruction Group – under CS-SCD-SSA-SSI Dept



Fermilab

Membership

- Lindsey Gray
- Rob Kutschke (Group leader)
- Gianluca Petrillo
- Erica Snider
- Mike Wang
- (Tom Junk)
- (Wes Ketchum)
- (Gabe Perdue)
- (Tingjun Yang)

First Project

- Request from Spentz:

> I hear from many sources that the native Kalman Filter in LArSoft has both performance issues (in terms of fidelity, not speed) and appears to be not well put together. I would like to ask you to work with the LArSoft team (through Ruth) to get your group to review this code and provide recommendations for improvements.

- I had a preliminary look:
  - Get the lay of the land to understand how to organize a review
  - Short report: recommended that the LArSoft team work on items identified in the report.
  - After LArSoft has made progress on these, re-evaluate what sort of review is needed.

Some possible early projects:

- Respond to requests from experiments/projects
- Work with experiments to find synergies
- Continue the investigation of Paraview visualization
- Package a machine learning example in a toolkit
- Propose a machine learning project for the INCITE program