

Statement of work for the LArSoft Project

V.10: Agreed by the Contributing Experiments and the Scientific Computing Division Head

7/11/2013

1. Scope

SCD ownership of the LArSoft Project is intended to include all functions necessary to facilitate the creation and maintenance of a common software infrastructure for the reconstruction and simulation of liquid argon (LAr) based detectors. The effort needed to develop the software is provided by the stakeholder experiments. The software falling under the purview of the project includes

- A set of experiment-independent “detector interfaces” capable of representing the geometry, detector response, and material properties of the relevant LAr detectors to the reconstruction and simulation
- The data structures (art¹ “data products”) that represent the input data to, and the output objects from the various reconstruction and simulation algorithms
- The reconstruction algorithms that rely only on the detector interfaces and input data products to extract the physics content from event data
- The simulation algorithms that rely only on the detector interfaces and input data products to produce simulated data
- The interfaces to any experiment-specific software plug-ins that are needed by the reconstruction or simulation
- Detector-independent visualization

The project specifically does not include:

- Any software that requires detector information not accessible via the detector interfaces
- Any software that requires specific knowledge of the identity of the experiment and that cannot reasonably be written in a way that is experiment independent. Examples include:
 - Algorithms for de-convolving signals from front-end electronics into charge measurements
 - Algorithms that produce calibration data for a particular detector
 - Algorithms that simulate the electronic response of the front-end electronics for a particular detector

The functions required to facilitate and maintain the common software cover the areas of project management, software and release management, and development effort and management.

¹ “art” is a software framework for simulation, reconstruction and analysis algorithms supported by SCD

2. Project management

SCD will:

- Maintain a set of requirements (where appropriate), milestones, metrics and schedules, and the list of people responsible for each.
- Provide regular updates to management and stakeholders
- Document requirements where appropriate
- Coordinate with stakeholders and developers toward completing milestones

The stakeholders will:

- Provide on a regular basis and upon request by project management any input needed to establish and maintain project requirements, milestones, metrics and schedules
- Provide management oversight of the project

3. Software and release management

SCD will:

- Maintain software repositories
- Maintain scripts needed to create, build and distribute releases
- Create and distribute releases needed by the experiments in a timely fashion, or as otherwise requested in advance by stakeholders
- Maintain a test suite framework that is integrated into the build and release procedure and that can be executed by either code management or code developers
- Establish policies related to the creation of releases and management of the software in consultation with the stakeholders
- Establish coding guidelines and design principles for software contributed to LArSoft
- Maintain sole discretion over the software architecture and physical design

The stakeholders will:

- Notify project management in advance of any plans that require a new LArSoft release, along with any specific requirements for that release
- Provide test software suitable for validating releases during the release creation process
- Comply with coding guidelines and design principles for contributed software
- Work with LArSoft code management to ensure compliance with the software architecture and physical design

4. Development effort and management

SCD will:

- Provide consulting services from computing professional with expertise in software design as needed on issues of design and implementation
- Provide assistance when possible with bringing contributed software into compliance with coding guidelines, design principles, architecture and physical design specifications
- Contribute to reconstruction and simulation algorithms as possible

The stakeholders will:

- Provide the effort needed to develop the core LArSoft software, in accordance with mutually agreed upon plans, schedules and milestones.
- Be solely responsible for developing all experiment-specific software that interfaces to LArSoft