LHCb Experiment Control System

Project code	55
Supervisor	Dr. Clara Gaspar
Department	EP (funding only for 2 EP projects)

Title

LHCb Experiment Control System

Description

LHCb's Experiment Control System handles the configuration, monitoring and operation of all experimental equipment involved in the various activities of the experiment. Millions of parameters originating from a large variety of equipment, ranging from commercial power supplies to sophisticated home made electronics, have to be collected, stored and presented to the physicists operating the experiment. The scale of the system requires the control system to run distributed over hundreds of computers in a coherent and coordinated, hierarchical, fashion. A commercial industrial-strength SCADA (Supervisory Control and Data Acquisition) System - Siemens WinCC-OA - has been chosen as the basis for the development. WinCC-OA has been complemented by another tool - SMI++ - combining a rule-based approach with Finite State Machine methodology, providing a very convenient mechanism for the modeling and automation of large scale, high complexity, installations. You would participate, depending on your preference, in projects related to the development and integration of new components (providing access to new hardware devices using either industrial technologies or through specialized 'drivers'), modeling of the behavior and error-recovery procedures of devices or complete sub-systems or development of intuitive user interfaces both for the configuration and operation of the system.

Functions and Training Value

You will be part of the central LHCb Online team, responsible for providing tools and expertise to all the sub-system developpers in the experiment and will gain experience with technologies used in industrial control and their application to the control and automation of very large distributed systems.

Qualifications/Skills

Programming Languages: C, C++