



Job description

Post title and post number	Programmer/Software Engineer - 52220
Department	School of Physics & Astronomy within the College of Engineering and Physical Sciences
Post No	52220
Full-time/Part-time	Full time
Duration of post	24 months
Grade	7
Salary	Starting salary is normally in the range £28,132 to £36,661. With potential progression once in post to £38,907 a year.
Additional information	Informal enquiries regarding this post should be directed to Professor Paul Newman - prn@hep.ph.bham.ac.uk
Terms and conditions	Administrative and Other Academic Related Staff
Closing date	29 th May 2014

Role Purpose

To create and contribute to the creation of knowledge by developing software to support the particle physics group's commitments within the ATLAS and LHCb experiments at the CERN Large Hadron Collider.

Main duties

- To contribute to the development of a major research project for the particle physics group through the development of new techniques and solutions, implemented in highly specialised software.
- To take the technical lead on the software development; this will involve coordinating with other colleagues both within the group and internationally.
- Regular communication will be required to understand the constantly developing priorities and requirements as the project evolves, and to ensure that the necessary solutions are found.

- To monitor the effectiveness of the procedures in use for the project development and recommend improvements accordingly.
- To apply knowledge in a way which develops new intellectual understanding.
- Work within specified research grants and projects.
- Specific duties will include some or all of the following:
 - Provision of expert support for the ATLAS experiment's first level calorimeter trigger (L1Calo) offline and simulation software, including the development and maintenance of the 'ByteStream' raw-to-object data converter and monitoring packages.
 - Primary responsibility for the L1Calo software validation package, as well as continual development of monitoring and debugging tools and of the off-line database software for specifying detector conditions and calibration constants in both data and Monte-Carlo simulations.
 - Maintenance and development of scripts to automatically run L1Calo calibration tasks whenever dedicated calibration runs are taken.
 - Provision of expert Grid support to the LHCb experiment, including distributed data management and ongoing production shifts.
 - Development and maintenance of release and regression testing framework for GEANT4 within LHCb.

Scope of the Role

- Primarily software design, implementation and framework development.
- Work within specified research grants and projects and contributions to writing grant applications.

Knowledge, Skills, Qualifications and Experience

Essential criteria

- Programming experience in C++, Python and Linux.
- First degree in a relevant subject (e.g. physics or software engineering).
- Experience with particle physics software methodology.
- Proven ability to work effectively both as part of a team and independently.
- Good time and priority management.

- Willingness to travel for short periods within the UK and abroad.
- Ability to work to deadlines/schedule within a project.
- Good presentation/communication/interpersonal skills.

Desirable criteria

- Fluency in relevant models, techniques or methods and ability to contribute to developing new ones.
- Experience in software framework of particle physics experiments.
- Experience of Geant4 simulation.
- Higher degree in a relevant subject (e.g. PhD in particle physics).

Planning and Organising

- Co-ordinate own work with others to avoid conflict or duplication of effort
- Contribute to the planning of the research project
- Plan for the use of research resources as appropriate

Decision Making

- Decide, in consultation with the principal investigator as appropriate, on the most appropriate way of undertaking the specified research activities.
- Decide, in consultation with the principal investigator as appropriate, how to analyse and interpret the data from the specified research activities.
- Decide, in collaboration with co-authors, which aspects of the research findings to include in a presentation or a publication and how to convey the findings.
- Give guidance, support and advice to colleagues on research related work.
- Independently conceive and develop algorithms and their implementations in highly specialised software environments.
- Contribute strongly, in consultation with internal and international external collaborators, to the provision and maintenance of software projects.

Internal/External Relationships

- Interact effectively with internal and international external colleagues who have physics and software backgrounds. This will take place at multiple levels and will

influence the project direction and decision making, in consultation with academic colleagues.

- Give regular presentations and updates at internal and external meetings.
- Liaise with research staff and support staff on research-related matters.
- Liaise with external collaborators on the research, where appropriate.