(B) Design pattern based object oriented software engineering for operation and control of large volume plasma device

Abstract

Large Volume Plasma device (LVPD) [1] is dedicated for fundamental studies relevant to earth's atmosphere and fusion plasmas. The machine control system [2-4] of LVPD is responsible for protected and synchronized operation of various subsystems of the device. The system is equipped with heterogeneous set of data items ranging from PXIe based instrumentation system to Modbus based slow control system. Object oriented software engineering provides reusable and maintainable software architecture at application layer while data flow based software architecture offered closed interaction with the system. A prototype of this architecture was developed for data acquisition system on PXIe instrumentation bus. This project will apply it for control and operation of other subsystems such as probe positioning system, filament power supply etc. The core libraries are developed in house and currently standalone monolithic application architecture is used for testing. As an extension, this project will focus on following objectives:

a. Exploration of Object orientation and analysis on data flow paradigm such as LabVIEW
b. Integration of existing LabVIEW applications into object oriented modules
c. Software quality analysis, Operation and performance testing

 Finally, developed software will become an integral part of central machine control system.

Relevant references [Publications, web links etc.]:

1. MATTOO, S. K., ANITA, V. P., AWASTHI, L. M. et. al., Rev. Sci. Instrum.**72** , 3864 (2001)
2. SUGANDHI, R., SRIVASTAVA, P. K., SANYASI, A. K., et. al.,*fusengdes.* 12, 804 (2016).
3. SUGANDHI, R., SRIVASTAVA, P. K., SANYASI, A. K., et. al.,*fusengdes.* 15, 49 (2017).
4. SANYASI, A. K., SUGANDHI, R., SRIVASTAVA, P. K., et.al. Rev. Sci. Instrum. 89,055113 (2008).

Eligibility: Only students of M.E. / M.Tech. / M.Sc. (Engineering) / M.S. in Computer Sc./Computer Engineering/Information Technology/ Information and communication technology branches can submit their application at Email: ritesh@ipr.res.in [Guide e-mail address], project_ee@ipr.res.in [Project Coordinator's e-mail address]

Phone Number: 079-2396 4010/2237   [Guide phone number]