Annexure-I

Title: Control Simulator development for Hyper-redundant robot

Background

Hyper-Redundant robots are high dexterity robots that can carry out inspection and maintenance activities in constrained locations of a reactor. Such robots have multiple degrees of freedom at each joint and are controlled using tendons. The control of such robots require precise and simultaneous actuation of multiple motors using a suitable control platform such as PLC/PXI. RHRTD Division has two working hyper-redundant prototype robots that will be used to test the developed control system.

Objective and Scope of Project

The project aims at developing a robust control system simulator using suitable platform for accurate positioning of a hyper-redundant robot. The project involves a theoretical study and simulation of various solution techniques to determine the position of the robot end-effector due to change in actuating motors. The project output will include positioning algorithm of robot, measurement of positional accuracy for various test conditions, simulation on virtual model.

Relevant references [Publications, web links etc.]:

P. Dutta, K.K. Gotewal, N. Rastogi, R. Tiwari, M. Stephen M,
A Hyper-Redundant Robot Development for Tokamak Inspection, in: Proc. Adv. Robot. - AIR, ACM Press, New York, New York, USA, 2017: a.12 . doi:10.1145/3132446.3134876.

Eligibility: Only students of …… Electronics/Electronics and Communication/Electrical with understanding of control systems, algorithm development and programming in Python/Matlab/C++ …….branches can submit their application at following email addresses

pramitd@ipr.res.in **and** **project_ee@ipr.res.in** **[Project coordinator's e-mail address]**

Phone Number: 079-23281022 / +91-8154085372 [Guide phone number]