

# **Design And Implementation Of A Java Based Distributed Control System**

## **Over The Internet: A Tele-Laboratory System**

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### **Summary**

In this paper, design and implementation of a Java based distributed control system over the Internet, is discussed. The main goal of the project is the development of a tele-laboratory system, which enables one to do experiments on equipments located at remote sites, by using the Internet. The main motivation for this project is the success of the well-known Australian tele-robot system. Following their success, many researchers tried to build web based laboratory systems. Being able to do a laboratory experiment over the Internet is a great convenience, leads to higher collaboration between researchers, and enables students to use the laboratory equipment whenever and wherever they want, as long as a computer with Internet connection is available. Despite these advantages, doing a laboratory experiment over the Internet is not as simple as doing it on site, and involves many new challenges. First of all, during the experiment one should be able to change laboratory equipment parameters, controller parameters, and system inputs remotely. Furthermore, there should be a high-speed data collection system, which can send the collected data to the remote computer for, graphical display. The most important requirement. is the need for a high-speed control loop executed with strict real-time requirements. Finally, a live video connection is necessary so that one can also watch the laboratory equipment and its response as live video. In this paper, we will discuss how we address these challenges, and in which aspects the proposed structure is an improvement of the existing tele-

laboratory implementations around the world.

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