

Microcontroller-based for system identification tools using least square method for RC circuits

Abstract

System identification is one of the method to construct a plant mathematical model from experimental data. This method has been widely applied in the automatic control, aviation, spaceflight medicine, society economics and other fields more. With the rapid growth of the science and technology, the system identification technique has increasingly grown in various applications. Since most of the system identification devices are off-line base, this means that the system identification can only be done after collecting the data and process through a computer devices. This paper will show how to process system identification method with real-time system. This method required a microcontroller as the medium to perform. That's why the system identification method will be programmed into a microcontroller, based on Least Square Method. Later, the system will be tested on a RC circuit to see the effect of the signal and the mathematical model obtained. The data will undergo the system identification toolbox for process using ARX and ARMAX model. On the other hand, the data will also be collected using the microcontroller created for analysis purpose. To ensure the validity of the model some verification methods are performed. Results show that the Least Square Method using Microcontroller base has the capability to work as a system identification tools.

Keywords; Least square method; RC circuits; System identification