

## **A New Approach to the Digital Implementation of Analog Controllers for a Power System Control**

**Authors :** G. Shabib, Esam H. Abd-Elhameed, G. Magdy

**Abstract :** In this paper, a comparison of discrete time PID, PSS controllers is presented through small signal stability of power system comprising of one machine connected to infinite bus system. This comparison achieved by using a new approach of discretization which converts the S-domain model of analog controllers to a Z-domain model to enhance the damping of a single machine power system. The new method utilizes the Plant Input Mapping (PIM) algorithm. The proposed algorithm is stable for any sampling rate, as well as it takes the closed loop characteristic into consideration. On the other hand, the traditional discretization methods such as Tustin's method is produce satisfactory results only; when the sampling period is sufficiently low.

**Keywords :** PSS, power system stabilizer PID, proportional-integral-derivative PIM, plant input mapping

**Conference Title :** ICSRD 2020 : International Conference on Scientific Research and Development

**Conference Location :** Chicago, United States

**Conference Dates :** December 12-13, 2020