

# **Improving Damping in Power System Oscillations using Fuzzy Logic Stabilizer**

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## **Abstract**

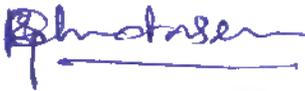
In general, power system oscillations are damped out using power system stabilizer (PSS). Conventional power system stabilizers are based on linear control theory. Therefore, they provide optimal operation at the nominal operating point around which the system is linearised during their designing process.

Power systems are in general non-linear and their operating point can vary over a wide range. Power System parameters also change with time because its configuration changes with time continuously. Therefore, a conventional power system stabilizer cannot provide better performance over the whole operating range since it cannot support the deviation of its parameters. Hence, a controlling method, which can tolerate the small deviation in system parameters, is highly welcome.

Fuzzy Logic provides a simple way to arrive at a definite conclusion based upon vague, ambiguous, imprecise, noisy or missing input information. So, a controller based on Fuzzy Logic (Fuzzy Logic Controller) is one of the most promising solutions to the above problem. Since, it can tolerate the changes in the system parameters, it may provide a better performance over a wide operating range. Hence, in this research project, a power system stabilizer based on Fuzzy Logic (FLPSS) has been designed and various tests have been conducted on it in order to check its effectiveness. The performance of the designed FLPSS has been compared with the performance of a particular conventional power system stabilizer and the FLPSS has shown better performance at each occasions.

## DECLARATION

I hereby declare that this submission is my own work and that, to the best of my knowledge and behalf, it contains no material previously published or written by another person nor material, which to substantial extent, has been accepted for the award of any other academic qualification of an university or institute of higher learning except where acknowledgement is made in text.



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## **Basic Acronyms**

<b>CPSS</b>	- Conventional Power System Stabilizer
<b>DspeedD</b>	- Derivative of the speed deviation
<b>FIS</b>	- Fuzzy Inference System
<b>FLC</b>	- Fuzzy Logic Controller
<b>FLPSS</b>	- Fuzzy Logic Power System Stabilizer
<b>GUI</b>	- Graphical User Interface
<b>PSS</b>	- Power System Stabilizer
<b>speedD</b>	- Speed Deviation



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