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To Enhance the Power Stability Using Fuzzy Logic

Krishan Kumar[1], Niranjan Kumar[2], Rajnish Mitter[3]
[1,2]*Research Scholar,EEE Deptt., BRCMCET, Bahal, Bhiwani, Haryana, India*
[3]*Associate Prof., EEE Deptt. BRCMCET, Bahal, Bhiwani, Haryana, India*

Abstract: *This paper describes the design of a Fuzzy logic based controller to counter the small instability in power system. The stabilizing signal is computed in real time using suitable fuzzy membership functions depending upon the state of the power factor. The use of output membership function permits further fine tuning of the controller parameters for varied system configurations especially in multi machine environment. The efficacy of the proposed stabilizing technique has been demonstrated using multi-machine computer simulation model of power system under a wide range of system and test conditions.*

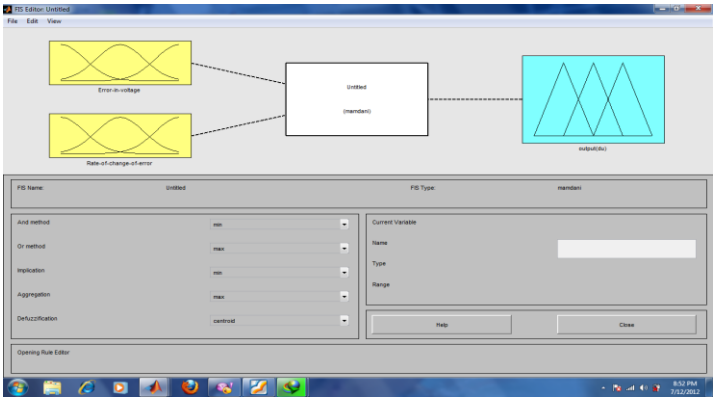
Keywords: *Capacitor bank, Power System Stabilizer (PSS, Fuzzy Logic Controller (FLC).*

I. INTRODUCTION

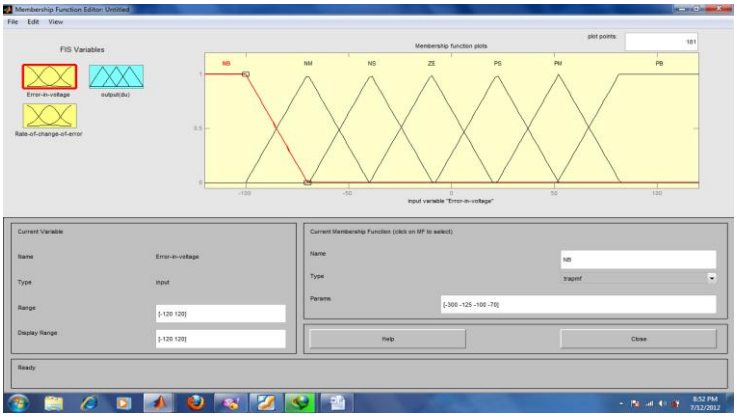
As inductive load goes on increasing on three phase power system the power factor of line which is given by 'CosΦ' also get increased. Here in this research paper a scheme is provided where shunt capacitor banks are used to improve the power factor. A number of different shunt capacitor banks will be used in this proposed in this project. Only a fixed number of capacitor banks will be used at a time based on the requirement. To switch the capacitor banks ON a thyristor based switch will be used. The switching of the thyristor will be controlled by the fuzzy logic controller.

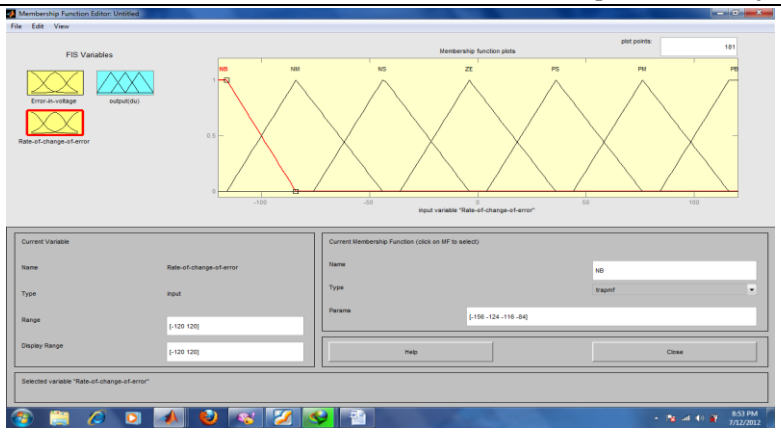
II. Structure Modelling

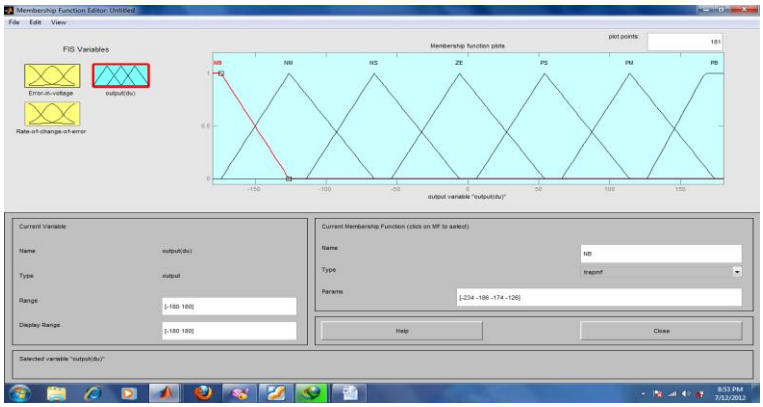
The modelling of this system will be done in fuzzy toolbox of MATLAB. The FIS editor of this particular toolbox is used to model the structure as shown.



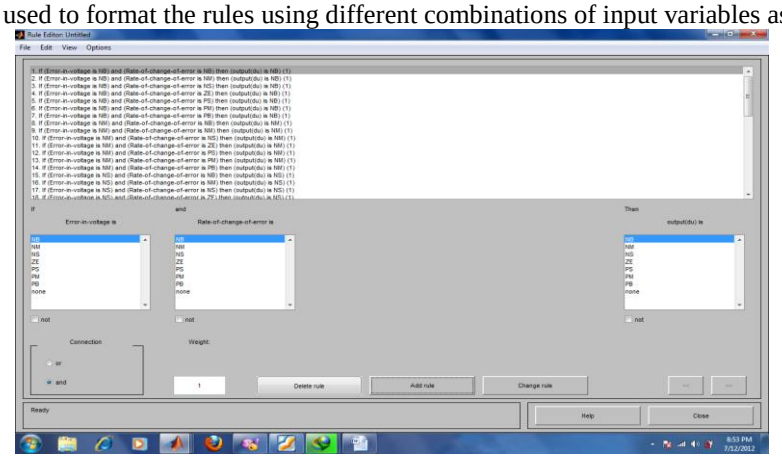
Here are 2 inputs and one output in the structure as shown in FIS editor. The next thing to be done is defining the membership functions for all the input and output variables. This will be done in the membership editor as shown.





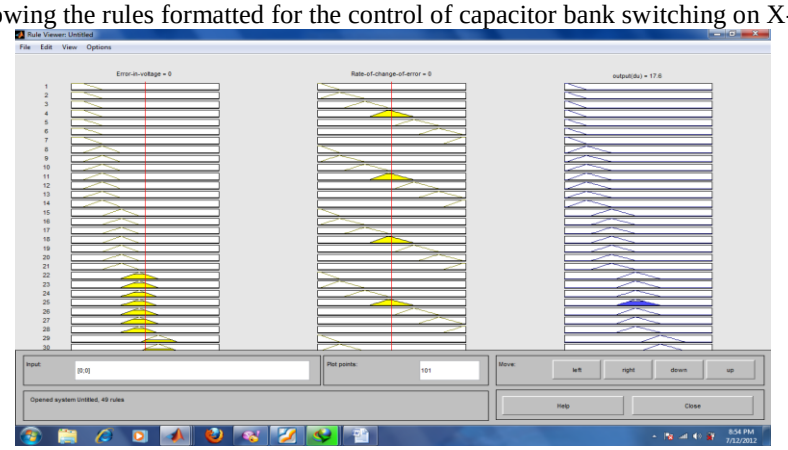


The rule editor will used to format the rules using different combinations of input variables as shown.

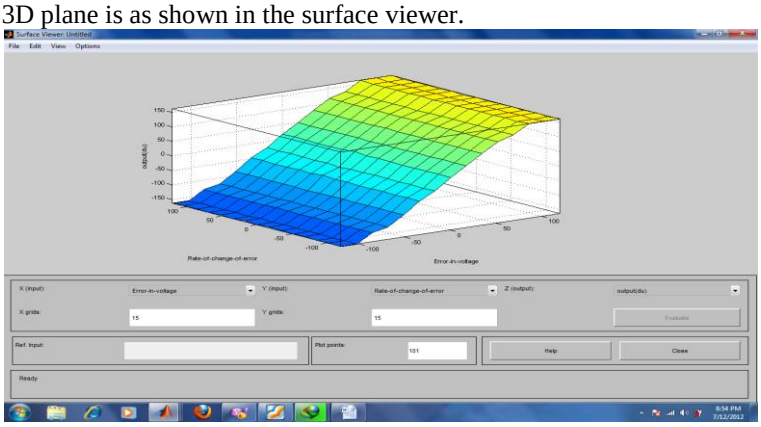


III. Results

The rule viewer showing the rules formatted for the control of capacitor bank switching on X-Y plane as shown.



The performance on 3D plane is as shown in the surface viewer.



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