



**Thesis Title** Maximum Power Control of Grid-Connected Solid Oxide Fuel Cell System Using Adaptive Fuzzy Logic Controller

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### ABSTRACT

This thesis presents a maximum power control of grid-connected solid oxide fuel cell system using the adaptive fuzzy logic controller. The system consists of a boost converter connected to the fuel cell and a three-phase inverter connected to the 380 Volt 50 Hz. utility grid. The adaptive fuzzy logic controller receives the current and voltage from the fuel cell when the temperature changes within the range of 800°C to 1100°C. Then the scaling factor and the membership functions of error and the change of error are adjusted by this controller. These parameters are sent to the fuzzy knowledge base controller in order to evaluate the inference. By using the inference, the duty ratio of the boost converter is controlled so that the fuel cell is able to provide the maximum power. It is found that the percentage of the maximum power using the adaptive fuzzy logic controller in the system is about 97% which is higher than the use of the conventional fuzzy logic controller and the Proportional-Integral (PI) controller.