

Maximum Power Point Neuro-Fuzzy Tracker for Photovoltaic Arrays

W. F. Mohammad, K. M. Al-Aubidy, M. M. Ali
Faculty of Engineering, Philadelphia University, Jordan
kma@philadelphia.edu.jo

Abstract:

Photovoltaic systems can meet virtually any electric power need and are used for several applications including satellites, telecommunications, homes, factories and businesses. Advancements in efficiency and cost reduction have made photovoltaic systems economically competitive with traditional power sources. This paper presents an intelligent method of maximum power point tracking for photovoltaic systems. The tracking algorithm is based on tracking the maximum power point by measuring the voltage and current of the solar array and computing the required duty cycle of the PWM signal to control a switch of a buck-boost DC to DC converter. Both conventional fuzzy logic controller and neuro-fuzzy controller are implemented to evaluate PV system performance. Obtained results show that the neuro-fuzzy controller can deal with different load and weather conditions and deliver more power from the photovoltaic systems.

Kyewords— Photovoltaic System, Solar cells, Fuzzy logic, Neuro-fuzzy, Maximum power point tracking.