Elman Neural Network for Dynamic Control of Wind Power Systems

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Keywords: photovoltaic system, radial basis function network, Elman neural network, maximum power point tracking, diesel-engine.

Abstract. This paper presents Elman neural network for the dynamic control strategies of a hybrid power system that include wind/photovoltaic/diesel system. Wind and PV power are the primary power sources of the system to take full advantages of renewable energy, and the diesel-engine is used as a backup system. A simulation model for the hybrid energy system has been developed using MATLAB/Simulink. To achieve a fast and stable response for the real power control, the intelligent controller consists of a Radial Basis Function Network (RBFN) and an modified Elman Neural Network (ENN) for maximum power point tracking (MPPT). The pitch angle of wind turbine is controlled by ENN, and the PV system uses RBFN, where the output signal is used to control the DC / DC boost converters to achieve the MPPT.