



An Innovative synthesis of deep learning techniques (DCapsNet & DCOM) for generation electrical renewable energy from wind energy

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Abstract

Renewable energy becomes one of the main resources that help the world to safety the environment from pollution and provide the people of new type of energy; therefore, this paper presents model called multi-objectives renewable energy-generation (MORE-G) for generating electrical energy from the wind. In general, this model consists of five basic phases: in a first phase collecting and preparing the data, so to make it in format suitable for the decision-making stage, this phase split into multi-steps (i.e., handle missing values and normalization dataset), and the second phase focuses on building constraints for each dataset and develops one of the optimization algorithms called cuckoo based on horizontal combination and multi-objective optimization used in third phase to generate the energy. Another model is developed as multi-layer neural network called (*DCapsNet*) based on linear combination and multi-objective functions used in the fourth phase to generate the energy. Final phase is related to evaluation of both models (*DCOM and DCapsNet*) to determine the best. The MORE-G is characterized by addressing one of the real problems, saving on material costs (i.e., reducing the need for manpower and reducing dependence on other countries in importing electric power) and upgrading the scope of the ministry of electricity.

Keywords *DCapsNet* · *DCOM* · Search method · Optimization · Multi-objective optimization · Green energy

1 Introduction

With rapid developments in integrating renewable energy power generation with the existing power system networks, the complexities also equally amplify. Due to sustainability requirements renewable energy power generation is inevitable and becoming so vital in modern smart power generation. Perhaps modern techniques ensure effective renewable energy harvesting, and still uncertainties and complexities

insist more suitable procedures to integrate the conventional power system with renewable energy sources. By integrating renewable energy resources electric industry can regularize according to The Clean Air Act Amendments, thus reducing the emission level dispersed in atmosphere. Renewable energy is a kind of inexhaustible energy that is not depleted and is called renewable energy because it comes from natural resources (i.e., wind, water, sun), the most important characteristic of a clean and environmentally friendly energy that does not lose harmful gases such as carbon dioxide, which does not adversely affect the surrounding environment. It does not play a role that affects the temperature level. Renewable sources of energy are completely incompatible with their non-renewable sources, such as natural gas and nuclear fuel. These sources lead to global warming and the release of carbon dioxide when used, and there are several types of renewable energy: solar energy, bioenergy, wind power, hydroelectric power, sustainable biofuel energy, geothermal or geothermal energy, tidal energy. For example, Iceland is one of the leading countries in renewable energy, and it provides 100% of its electricity needs by generating renewable sources, particularly geothermal energy for heating homes, lighting and electricity generation for industrial use and the like,

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