

Can slime mould algorithm optimize a hybrid microgrid for Energy Trilemma goals?

Provided by the Springer Nature SharedIt content-sharing initiative This study presents a multi-objective optimization of a hybrid microgrid (HMG) targeting the energy trilemma goals--energy security, affordability, and sustainability--using the Slime Mould Algorithm (SMA).

Why was the slime mould algorithm selected for this study?

The Slime Mould Algorithm (SMA) was selected for this study due to its superior global search capability and adaptability in multi-objective optimization of complex power systems, as established in recent literature 14, 20.

What is slime mould algorithm (SMA)?

The mathematical formulation of the Slime Mould Algorithm (SMA), including initialization, position updating, and fitness evaluation, is adopted from the original work in 14, with further enhancements and parameter tuning strategies incorporated from recent studies in 18, 17.

Is mg network a trilemma subcomponent of energy security?

The overall objective function here is to Minimise [Pi]Subject to power flow,voltage and current magnitudes constraints. The reliability of the MG network is one of the trilemma subcomponents of energy security. Though in this study both power loss minimization and LPSP and voltage deviation index (VDI) are considered as energy security elements.

While it's used primarily to produce thin-film solar cells, it's also used in a diverse range of other products like solar thermoelectric devices for both cooling and energy generation, copy ...

Maximizing Power Point Tracking (MPPT) is an essential technique in photovoltaic (PV) systems that guarantees the highest potential conversion of sunlight energy under any irradiance ...

A new application of the slime mould algorithm (SMA) stochastic optimization method represents one of the main contributions in this paper. The employment of the slime mould algorithm ...

Various techniques have been used in the optimization of hybrid renewable energy systems (HRES). The most effective are metaheuristic algorithms based on artificial intelligence (AI) ...

This paper proposes a novel hybrid slime mould assisted with perturb and observe (P& O) MPPT approach (HSMO) with hybrid bridge link-honey comb (BL-HC) configured PV system to ...

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Solar photovoltaic (SPV) systems are becoming key emerging technologies for both stand-alone and

grid-connected power system applications. However, uncertainty in environmental ...

Recently, the integration of renewable energy sources, specifically photovoltaic (PV) systems, into power networks has grown in significance for sustainable energy generation.

This study presents a multi-objective optimization of a hybrid microgrid (HMG) targeting the energy trilemma goals--energy security, affordability, and sustainability--using the Slime Mould ...

The growth at which new power generation PV plants have been installed has not slowed down in recent years. As of now, projections for the year 2020 suggest a ...

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