

Optimal Control Algorithms for DC Micro-grids

Applications

Applications for this technique are found in islanded electric power supply systems for remote areas and compounds

Problem addressed

With the presence of clean energy sources and electric storage devices, micro-grids are becoming an alternative solution to overcome energy shortening caused by the depletion of conventional fossil energy sources. Considering that most of these devices (photovoltaic panels, fuel cells, and batteries) operate with a DC current, DC micro-grids are gaining high attention.

Technology

The proposed solution focusses on the design of distributed DC micro-grids with hybrid renewable sources (PV and wind generators), a diesel generator and storage devices for a remote load including electric vehicles charging systems. The aim is to control the power generation in order to minimize the fuel consumption and the greenhouse gas emissions.

Advantages

- Lower greenhouse gas emissions
- Lower fuel consumption
- Eco-friendly self-sufficient electric power supply
- Sustainability
- Trade-off between electric vehicle charging/discharging and load demand

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