ID de Contribution: **33** Type: **Non spécifié**

Optimal Microgrid Sizing using Gradient-based Algorithms with Automatic Differentiation

jeudi 5 octobre 2023 13:30 (30 minutes)

Microgrid sizing optimization is often formulated as a black-box optimization problem. This allows modeling the microgrid with a realistic temporal simulation of the energy flows between components. Such models are usually optimized with gradient-free methods, because no analytical expression for gradient is available. However, the development of new Automatic Differentiation (AD) packages allows the efficient and exact computation of the gradient of black-box models. Thus, this work proposes to solve the optimal microgrid sizing using gradient-based algorithms with AD packages. However, physical realism of the model makes the objective function discontinuous which hinders the optimization convergence. After an appropriate smoothing, the objective is still nonconvex, but convergence is achieved for more that 90% of the starting points. This suggest that a multi-start gradient-based algorithm can improve the state-of-the-art sizing methodologies.

Orateur: HAESSIG, Pierre (CentraleSupélec, IETR)

Classification de Session: Posters