❏　　1

Model-Predictive Control based on Harris Hawks Optimization for Split-Source Inverter

Youssuf Elthokaby[1], Ibrahim Abdelsalam[2], Naser Abdel-Rahim[3], Islam Mohamed [1],
[1]EE Department, Faculty of Engineering at Shoubra, Benha University, Egypt,
[2] Arab Academy for Science and Technology and maritime transport, Cairo, Sheraton Campus 2033, Egypt,
[3] Future University in Egypt

Article Info	ABSTRACT
Article history: Received month dd, yyyy Revised month dd, yyyy Accepted month dd, yyyy *Keywords:* Split-source inverter Model predictive control Discrete time model Cost function Optimization technique	This paper proposed a modified algorithm for controlling a single-phase split-source inverter. The proposed algorithm is a modified model predictive control based on Harris Hawks optimization, where the AC output voltage, the DC-link voltage, and the DC input current are controlled within one cost function. Hence, the discrete time models of both AC-side and DC-side are obtained. For proper operation of the modified MPC, each error term within the cost function has a weighting factor. Harris Hawks optimization technique is used to determine the weighting factors at each term of the cost function. The proposed algorithm is validated using MATLAB/SIMULINK. Simulation results show that the system has succeeded in controlling AC load voltage, input current, and achieving constant DC-link voltage over a wide operating range. *This is an open access article under the [CC BY-SA](#) license.*

Corresponding Author:

Youssuf Elthokaby
Electrical Engineering Department, Faculty of Engineering at Shoubra, Benha University, Cairo, Egypt
Email: youssef.hassan@feng.bu.edu.eg