



OPTIMIZATION OF A STANDALONE PHOTOVOLTAIC SYSTEM USING INTELLIGENT TECHNIQUES

BY

Eng. Mohamed Mostafa Ahmed El Sotouhy

A Thesis Submitted to the
Faculty of Engineering at Cairo University
in Partial Fulfillment of the
Requirements for the Degree of
MASTER OF SCIENCE
in
ELECTRICAL POWER AND MACHINES ENGINEERING

**FACULTY OF ENGINEERING, CAIRO UNIVERSITY
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List of Abbreviations

AI	Artificial Intelligent
ANNs	Artificial Neural Networks
AC	Alternative Current
ADC	Analog to Digital Converter
A/D	Analog to Digital
BLDCM	Brushless Direct Current Motor
BLDC	Brushless Direct Current
CCM	Continuous Conduction Mode
COG	Center Of Gravity algorithm
CO₂	Carbon dioxide
DAC	Digital to Analog Converter
D/A	Digital to Analog
DCM	Discontinuous Conduction Mode
DC	Direct Current
DOD	Depth of Discharge
DSP	Digital Signal Processing
EMF	Electromotive Force
FL	Fuzzy Logic
IC	Intermittent Charging
INC-CON	Incremental Conductance
IM	Induction Motor
Km	Kilo-meters

KCL	Kirchhoff's Current Law
KVL	Kirchhoff's Voltage Law
L-ion	Lithium Ion
LRC	Load Starting current
LRT	Load Starting Torque
MPP	Maximum Power Point
MPPT	Maximum Power Point Tracking
NiCad	Nickel Cadmium
NiMH	Nickel Metal Hydride
PMBLDC	Permanent Magnet Brushless DC Motor
PMDC	Permanent Magnet Direct Current
PV	Photovoltaic
Pb-S	Lead Acid
PWM	Pulse Width Modulation
P&O	Perturb and Observe
rpm	Revolution Per Minute
SRM	Switched Reluctance Motors
SEPIC	Single-Ended Primary Inductor Converter
SOC	State of Charge
T_R	Rated Torque
T_P	Peak Torque
UN	United Nations
VRLA	Valve Regulated Lead Acid