Ramptime Current -Controlled APF for Harmonic Mitigation, Power Factor Correction and Load Balancing

Mazen Abdel-Salam, Adel Ahmed, Mohamed Abdel-Sater

Abstract:

This paper presents a simulation for a shunt active power filter aimed at mitigation of harmonics, power factor correction and balancing of unbalanced three-phase system. The system consists of load fed through a six pulse bridge rectifier. The active power filter consists of a three-phase current-controlled voltage source inverter (CC-VSI) with a filter inductance at the ac output and a dc-bus capacitor. The CC-VSI is operated to directly control the ac source current to be sinusoidal and in phase with the ac source voltage. The inverter switching is controlled using ramp-time current control being based on the concept of zero average current error (ZACE). The active power filter reference currents are generated using perfect harmonic cancellation (PHC) control method. The proposed filter successfully succeeded in reducing the total harmonic distortion (THD) to less than unity, correcting power factor to unity and balancing of unbalanced currents under sinusoidal and distorted supply voltages. The dynamic performance of the proposed filter is so fast to meet the dynamic load conditions.

Published In:

Proceedings of the 14th International Middle East Power Systems Conference (MEPCON'10) , , PP.144-150
Harmonic Mitigation, Maximum Power Point Tracking, and Dynamic Performance of Variable-speed Grid-connected Wind Turbine

Mazen Abdel-Salam; Adel Ahmed; Mohamed Abdel-Sater

Abstract:

This article presents a method for harmonic mitigation and maximum power point tracking for a variable-speed grid-connected 20-kW wind turbine. The wind energy conversion system consists of a permanent magnet synchronous generator driven by variable-speed 20-kW wind turbine. The output of the permanent magnet synchronous generator is connected to a single-switch three-phase boost rectifier to generate DC voltage, which feeds a current-controlled inverter to interface the system with the electric utility. The single-switch three-phase boost rectifier is an active power factor correction technique to maintain the power factor at the permanent magnet synchronous generator side to nearly unity and mitigate the permanent magnet synchronous generator current harmonics. To mitigate inverter output current and voltage harmonics, an LCL filter has been used. A complete analysis of the harmonic content has been done everywhere in the system. The results show that the proposed maximum power point tracking control strategy succeeded to track the maximum wind power irrespective of the wind speed. This strategy in presence of an LCL filter achieved harmonic mitigation at the permanent magnet synchronous generator and inverter output sides. The dynamic response of the wind energy conversion system is tested under a three-phase fault condition. For comparison purposes, an active power filter is designed and checked against the single-switch three-phase boost rectifier for harmonic mitigation at the permanent magnet synchronous generator side.

Published In:

Electric Power Components and Systems, Vol. 39, PP. 176-190
Steady-state Modeling and Control of a Microgrid Supplying Irrigation Load in Toshka Area

Mazen Abdel-Salam, Adel Ahmed, Hamdy Ziedan, Rashad Kamel, Khairy Sayed, Mahmoud Amery and Mohamed Swify

Abstract:

This paper is aimed at sizing solar-wind-battery standalone microgrid for supplying irrigation and domestic loads in Toshka area, Toshka, Egypt. Not only the MG system components but also the interconnection cables and feeders are sized. Steady-state power flow through the MG system is analysed at varying sun irradiation and wind speed. Modeling of the MG components and their control of system voltages, currents and powers are investigated. Power flows during different MG operation conditions including absence of wind and sun as well as sudden disconnection of the load are studied.

Keywords:

Hybrid Solar-Wind, Irrigation System, Toshka Area, control system, power flow

Published In:

IECON 2012 - 38th Annual Conference on IEEE Industrial Electronics Society, 6
Harmonic Mitigation and Maximum Power Point Tracking for Variable Speed Grid Connected

Mohamed Abdel-Sater Swify

Abstract:

This paper presents a method for harmonic mitigation and maximum power point tracking (MPPT) for a variable speed-grid connected 20 kW wind turbine. The wind energy conversion systems consist of permanent magnet synchronous generator (PMSG) driven by variable-speed 20 kW wind turbine. The output of the PMSG is connected to a single switch three-phase boost rectifier to generate DC voltage which feeds a current controlled inverter to interface the system with the electric utility. The single switch three-phase boost rectifier is an active power factor correction technique to maintain the power factor at the PMSG side to nearly unity and mitigate the PMSG current harmonic. To mitigate inverter output current and voltage harmonics, an LCL filter has been used. A complete analysis of the harmonic content has been done everywhere in the system. The results show that the proposed MPPT control strategy succeeded to track the maximum wind power irrespective of the wind speed. This strategy in presence of LCL filter achieved harmonic mitigation at the PMSG and inverter output sides

Keywords:

machine control; maximum power point trackers; permanent magnet generators; power convertors; power factor correction; power harmonic filters; rectifying circuits; synchronous generators; wind turbines; LCL filter; MPPT control strategy; active power factor correction;grid connected wind turbine; harmonic mitigation; maximum power point tracking; maximum wind power; permanent magnet synchronous generator; power 20 kW; three phase boost rectifier; variable speed wind turbine; wind energy conversion system; Active filters; Harmonic analysis; Inverters; Power harmonic filters; Rectifiers; Switches; Wind turbines; Harmonic mitigation; MPPT;PMSG; Variable speed wind turbine; power electronics

Published In:

Energy Conference and Exhibition (EnergyCon), 2010 IEEE International , , 5
Design and Implementation of Stand-alone Residential PV System

Mazen Abdel-Salam, Adel Ahmed, Mahmoud Amery, Mohamed Swify, Ahmed El-kousy, Khairy Sayed

Abstract:

This paper is focused on construction of a stand-alone residential 2-kW centralized PV system to feed different domestic loads at a home including lighting loads, washing machine, TV, refrigerator and computer. The stand-alone residential 2-kW PV system consists of PV generator, storage batteries, charge regulator, inverter, filter and maximum power point tracking control system. The paper in steps includes PV modeling, software development for monitoring storage batteries, development of maximum power point tracking controller, design and implementation of an inverter and use of a filter to improve the inverter output waveform.

Keywords:

PV system, residential load, inverter, filter

Published In:

Applied Electrical Engineering and Computing Technologies (AEECT), 2011 IEEE Jordan Conference on, 6
Finite set model predictive control with on-line parameter estimation for active frond-end converters

Abdelrahem, Mohamed; Hackl, Christoph Michael; Kennel, Ralph

Abstract:

NULL

Keywords:

NULL

Published In:

Electrical Engineering, v 100, n 3, p 1497-1507
Implementation and experimental investigation of a sensorless field-oriented control scheme for permanent-magnet synchronous generators

Abdelrahem, Mohamed; Hackl, Christoph Michael; Kennel, Ralph

Abstract:

NULL

Keywords:

NULL

Published In:

Electrical Engineering, v 100, n 2, p 849-856
Robust Predictive Control for Direct-Driven Surface-Mounted Permanent-Magnet Synchronous Generators Without Mechanical Sensors

Abdelrahem, Mohamed; Hackl, Christoph M.; Zhang, Zhenbin; Kennel, Ralph

Abstract:

NULL

Keywords:

NULL

Published In:

IEEE Transactions on Energy Conversion, v 33, n 1, p 179-189
Finite Position Set-Phase Locked Loop for Sensorless Control of Direct-Driven Permanent-Magnet Synchronous Generators

Abdelrahem, Mohamed; Hackl, Christoph M.; Kennel, Ralph

Abstract:

NULL

Keywords:

NULL

Published In:

IEEE Transactions on Power Electronics, v 33, n 4, p 3097-3105
Fault-ride through strategy for permanent-magnet synchronous generators in variable-speed wind turbines

Abdelrahem, Mohamed; Kennel, Ralph

Abstract:

NULL

Keywords:

NULL

Published In:

MDPI AG, Postfach, Basel, CH-4005, Switzerland, vol.9, issue 12, NULL
Simplified Sensorless Current Predictive Control of Synchronous Reluctance Motor Using Online Parameter Estimation

Ahmed Farhan, Mohamed Abdelrahem, Amr Saleh, Adel Shaltout, Ralph Kennel

Abstract:

NULL

Keywords:

NULL

Published In:

Energies, 13-2, 492
2019 Index IEEE Transactions on Energy Conversion


Abstract:

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Keywords:

NULL

Published In:

IEEE Transactions on Energy Conversion, 24-4, NULL
Efficient model predictive power control with online inductance estimation for photovoltaic inverters

Issa Hammoud, Khaled Morsy, Mohamed Abdelrahem, Ralph Kennel

Abstract:

NULL

Keywords:

NULL

Published In:

Electrical Engineering, NULL, NULL
Enhanced Sensorless Model Predictive Control of Induction Motor Based on Extended Kalman Filter

Ahmed Ibrahim Soliman, Ahmed Farhan, Mohamed Abdelrahem, Ralph Kennel

Abstract:

NULL

Keywords:

NULL

Published In:

Finite-Set MRAS Observer for Encoderless Control of PMSGs in Wind Turbine Applications

Mohamed Abdelrahem, Christoph Hackl, Ahmed Farhan, Ralph Kennel

Abstract:

NULL

Keywords:

NULL

Published In:

Predictive Direct Torque Control of Permanent Magnet Synchronous Generators (PMSGs) without Weighting Factors

Prodyut Das, Mohamed Abdelrahem, Ahmed Farhan, Mohamed A Ismeil, Ralph Kennel

Abstract:

NULL

Keywords:

NULL

Published In:

2019 IEEE Conference on Power Electronics and Renewable Energy (CPERE) , NULL , 296-301
Direct Predictive Speed Control With a Sliding Manifold Term for PMSM Drives

Xiaonan Gao, Mohamed Abdelrahem, Christoph M Hackl, Zhenbin Zhang, Ralph Kennel

Abstract:

NULL

Keywords:

NULL

Published In:

IEEE Journal of Emerging and Selected Topics in Power Electronics
Design of State-Feedback Controller for a Single-Phase Grid Connected Siwakoti-H Inverter with LCL filter

Mirza Abdul Waris Begh, Eyke Liegmann, Akshay Mahajan, Aswin Palanisamy, Yam P Siwakoti, Petros Karamanakos, Mohamed Abdelrahem, Ralph Kennel

Abstract:

NULL

Keywords:

NULL

Published In:

PCIM Europe 2019; International Exhibition and Conference for Power Electronics, Intelligent Motion, Renewable Energy and Energy Management, NULL, 1-8
Three phase Semi-Z-Source Inverter for PV Applications

Mohamed Abdelrahem, Mohamed A Ismeil, Mohamed Orabi, Ralph Kennel

Abstract:

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Keywords:

NULL

Published In:

PCIM Europe 2019; International Exhibition and Conference for Power Electronics, Intelligent Motion, Renewable Energy and Energy Management, NULL, 1-6
Sensorless Predictive Speed Control of Permanent-Magnet Synchronous Generators in Wind Turbine Applications

Mohamed Abdelrahem, Christoph Hackl, Ralph Kennel, Jose Rodriguez

Abstract:

NULL

Keywords:

NULL

Published In:

PCIM Europe 2019; International Exhibition and Conference for Power Electronics, Intelligent Motion, Renewable Energy and Energy Management, NULL, 1-8
Efficient finite-position-set MRAS observer for encoder-less control of DFIGs

Mohamed Abdelrahem, Ralph Kennel, Mehmet Dal, Christoph Hackl, Jose Rodriguez

Abstract:

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Keywords:

NULL

Published In:

2019 IEEE International Symposium on Predictive Control of Electrical Drives and Power Electronics, PRECEDE 2019, NULL, NULL
-Multiple-vector direct model predictive control for grid connected power converters with reduced calculation burden

Mohamed Abdelrahem, Faris Hamadto, Anath Garikapati, Ralph Kennel, José Rodríguez

Abstract:

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Keywords:

NULL

Published In:

Te, 3, 2
High-Precision Sensorless Predictive Control of Salient-Pole Permanent Magnet Synchronous Motor based-on Extended Kalman Filter.

Ahmed Farhan, Mohamed Abdelrahem, Amr Saleh, Adel Shaltout, Ralph Kennel

Abstract:

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Keywords:

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Published In:

Proc. of the 21st International Middle East Power Systems Conference (MEPCON 2019) , NULL , NULL
Computationally efficient model predictive direct power control with online finite set model inductance estimation technique for grid-connected photovoltaic inverters

Issa Hammoud, Khaled Morsy, Mohamed Abdelrahem, Ralph Kennel

Abstract:

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Keywords:

NULL

Published In:

IEEE international symposium on predictive control of electrical drives and power electronics (PRECEDE). https://doi.org/10.1109/PRECEDE, NULL, NULL
Predictive Control of Grid-Connected Photovoltaic Inverter Optimizing Switching Frequency and Power Quality.

A Farhan, R Kennel, M Abdelrahem, M Habib, AA Ladjici

Abstract:

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Keywords:

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Published In:

PIM Europe, NULL, NULL
Efficient direct-model predictive control with discrete-time integral action for PMSGs

Mohamed Abdelrahem, Christoph Michael Hackl, Ralph Kennel, Jose Rodriguez

Abstract:

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Keywords:

NULL

Published In:

IEEE Transactions on Energy Conversion, 34-2, 1063-1072
A direct power control strategy for three level neutral-point clamped rectifier under unbalanced grid voltage

Billel Kahia, Abdelouahab Bouafia, Abdelmadjid Chaoui, Zhenbin Zhang, Mohamed Abdelrahem, Ralph Kennel

Abstract:

NULL

Keywords:

NULL

Published In:

Electric Power Systems Research, 161, 103-113
Enhanced electromechanical modeling of asymmetrical dual three-phase IPMSM drives

Hisham Eldeeb, Mohamed Abdelrahem, Christoph Hackl, Ayman Samy Abdel-Khalik

Abstract:

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Keywords:

NULL

Published In:

2018 IEEE 27th International Symposium on Industrial Electronics (ISIE), NULL, 126-132
Computationally efficient predictive direct torque control strategy for pmsg without weighting factors

Mohamed Abdelrahem, Hisham Eldeeb, Christoph Hackl, Ralph Kennel, Jose Rodriguez

Abstract:

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Keywords:

NULL

Published In:

PCIM Europe 2018; International Exhibition and Conference for Power Electronics, Intelligent Motion, Renewable Energy and Energy Management , NULL , 1
A sliding-mode-observer for encoderless direct model predictive control of PMSGs

Mohamed Abdelrahem, Philipp Catterfeld, Christoph Hackl, Ralph Kennel

Abstract:

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Keywords:

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Published In:

PCIM Europe 2018; International Exhibition and Conference for Power Electronics, Intelligent Motion, Renewable Energy and Energy Management, NULL, 1-8
A predictive direct power control strategy for three-level npc rectifier

K Billel, A Bouafia, M Abdelrahem, Z Zhang, A Chaoui, A Krama, R Kennel

Abstract:

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Keywords:

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Published In:

5th International Conference on Electrical Engineering-Boumerdes (ICEE-B) , INSPEC Accession Number: 17429711 , NULL
A unified SVPWM realization for minimizing circulating currents of dual three phase machines

Hisham Eldeeb, Christoph Hackl, Mohamed Abdelrahem, Ayman Samy Abdel-Khalik

Abstract:

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Keywords:

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Published In:

2017 IEEE 12th International Conference on Power Electronics and Drive Systems (PEDS) , NULL , 925-931
-Multi level hysteresis direct power control strategy for three level npc rectifier

Billel Kahia, Abdelouaheb Bouafia, Mohamed Abdelrahem, Zhenbin Zhang, Abdelmadjid Chaoui, Abdelbasset Krama, Ralph Kennel

Abstract:

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Keywords:

NULL

Published In:

2017 5th International Conference on Electrical Engineering-Boumerdes (ICEE-B) , NULL , 1-6
Predictive phase locked loop for sensorless control of PMSG based variable-speed wind turbines

Mohamed Abdelrahem, Ali El Hafni, Ralph Kennel, Christoph M Hackl

Abstract:

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Keywords:

NULL

Published In:

2017 IEEE International Symposium on Sensorless Control for Electrical Drives (SLED) , NULL , 151-156
Position estimation for linear electromagnetic actuators

Ali El Hafni, Mohamed Abdelrahem, Ralph Kennel

Abstract:

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Keywords:

NULL

Published In:

2017 IEEE International Symposium on Sensorless Control for Electrical Drives (SLED), NULL, 219-224
Computationally efficient predictive control of three-level NPC converters with DC-link voltage balancing: A priori state selection approach

Ferdinand Grimm, Zhenbin Zhang, Mohamed Abdelrahem, Ralph Kennel

Abstract:

NULL

Keywords:

NULL

Published In:

2017 IEEE International Symposium on Predictive Control of Electrical Drives and Power Electronics (PRECEDE), NULL, 72-77
Simple and robust direct-model predictive current control technique for pmsg in variable-speed wind turbines

Mohamed Abdelrahem, Zhenbin Zhang, Ralph Kennel, Hisham Eldeeb, Christoph Hackl

Abstract:

NULL

Keywords:

NULL

Published In:

2017 IEEE International Symposium on Predictive Control of Electrical Drives and Power Electronics (PRECEDE), NULL, 1-6
Robust predictive control for direct-driven surface-mounted permanent-magnet synchronous generators without mechanical sensors

Mohamed Abdelrahem, Christoph M Hackl, Zhenbin Zhang, Ralph Kennel

Abstract:

NULL

Keywords:

NULL

Published In:

IEEE Transactions on Energy Conversion, 33-1, 179-189
A robust encoderless predictive current control using novel MRAS observer for surface-mounted permanent-magnet synchronous generators

Mohamed Abdelrahem, Christoph Hackl, Ralph Kennel

Abstract:

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Keywords:

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Published In:

PCIM Europe 2017; International Exhibition and Conference for Power Electronics, Intelligent Motion, Renewable Energy and Energy Management, NULL, 1-8
Implementation of Extended Kalman Filter for PMSG Considering the Dynamics of the Mechanical System

Mohamed Abdelrahem, Christoph Hackl, Ralph Kennel

Abstract:

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Keywords:

NULL

Published In:

PCIM Europe 2017; International Exhibition and Conference for Power Electronics, Intelligent Motion, Renewable Energy and Energy Management, NULL, 1-8
Direct-model predictive control for fault ride-through capability enhancement of DFIG

Mohamed Abdelrahem, Ralph Kennel

Abstract:

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Keywords:

NULL

Published In:

PCIM Europe 2017; International Exhibition and Conference for Power Electronics, Intelligent Motion, Renewable Energy and Energy Management, NULL, 1-8
Efficient direct model predictive control for doubly-fed induction generators

Mohamed Abdelrahem, Ralph Kennel

Abstract:

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Keywords:

NULL

Published In:

Electric Power Components and Systems, 45-5, 574-587
Simplified model predictive current control without mechanical sensors for variable-speed wind energy conversion systems

Mohamed Abdelrahem, Christoph Michael Hackl, Ralph Kennel

Abstract:

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Keywords:

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Published In:

Electrical Engineering, 99-1, 367-377
-A new Look-up Table-Direct Power Control Strategy for Three Level NPC Rectifier Using Predictive DPC

Billel Kahia, A Bouafia, A Chaoui, M Abdelrahem, R Kennel

Abstract:

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Keywords:

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Published In:

Sustainable energy supply and energy storage systems (NEIS 2017), Hamburg, Germany, NULL, NULL
( 45 )

Model predictive control for low-voltage ride through capability enhancement of DFIGs in variable-speed wind turbine systems

Mohamed Abdelrahem, Muhammad Hosnee Mobarak, Ralph Kennel

Abstract:

NULL

Keywords:

NULL

Published In:

2016 9th International Conference on Electrical and Computer Engineering (ICECE) , NULL , 70-73
Realization of low-voltage ride through requirements for PMSGs in wind turbines systems using generator-rotor inertia

Mohamed Abdelrahem, Muhammad Hosnee Mobarak, Ralph Kennel

Abstract:

NULL

Keywords:

NULL

Published In:

2016 9th International Conference on Electrical and Computer Engineering (ICECE), NULL, 54-57
Finite control set-model predictive control with on-line parameter estimation for variable-speed wind energy conversion systems

Nico Stati, Mohamed Abdelrahem, Muhammad Hosnee Mobarak, Ralph Kennel

Abstract:

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Keywords:

NULL

Published In:

2016 International Symposium on Industrial Electronics (INDEL), NULL, 1-6
Encoderless model predictive control of doubly-fed induction generators in variable-speed wind turbine systems

Mohamed Abdelrahem, Christoph Hackl, Ralph Kennel

Abstract:

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Keywords:

NULL

Published In:

Journal of Physics: Conference Series, 753-11, NULL
Filter design for grid-connected multilevel CHB inverter for battery energy storage systems

Taha Lahlou, Mohamed Abdelrahem, Susana Valdes, Hans-Georg Herzog

Abstract:

NULL

Keywords:

NULL

Published In:

2016 International Symposium on Power Electronics, Electrical Drives, Automation and Motion (SPEEDAM), NULL, 831-836
-Stabilization of the DC-link voltage in a two stage cascaded H Bridge multilevel converter for battery energy storage systems

Taha Lahlou, Daniel Wittmann, Mohamed Abdelrahem, Hans-Georg Herzog

Abstract:

NULL

Keywords:

NULL

Published In:

2016 IEEE International Energy Conference (ENERGYCON) , 1-6 , NULL
Model Predictive Control of Permanent Magnet Synchronous Generators in Variable-Speed Wind Turbine Systems

Mohamed Abdelrahem, Christoph Hackl, Ralph Kennel

Abstract:

NULL

Keywords:

NULL

Published In:

Power and Energy Student Summit 2016 (PESS 2016), NULL, NULL
Voltage Sensorless Direct Model Predictive Control of 3L-NPC Back-to-Back Power Converter PMSG Wind Turbine Systems with Fast Dynamics

Zhenbin Zhang, Christoph Hackl, Mohamed Abdelrahem, Ralph Kennel

Abstract:

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Keywords:

NULL

Published In:

Power and Energy Student Summit 2016 (PESS 2016) , NULL , NULL
Sensorless Control of Permanent Magnet Synchronous Generators in Variable-Speed Wind Turbine Systems

Mohamed Abdelrahem, Christoph Hackl, Zhenbin Zhang, Ralph Kennel

Abstract:

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Keywords:

NULL

Published In:

Power and Energy Student Summit 2016 (PESS 2016) , NULL , NULL
Sensorless Control of Doubly-Fed Induction Generators in Variable-Speed Wind Turbine Systems

Mohamed Abdelrahem, Christoph Hackl, Ralph Kennel

Abstract:

NULL

Keywords:

NULL

Published In:

Proceedings of the 5th International Conference on Clean Electrical Power, Taormina, Italy, NULL, NULL
Application of Extended Kalman Filter to Parameter Estimation of Doubly-Fed Induction Generators in Variable-Speed Wind Turbine Systems

Mohamed Abdelrahem, Christoph Hackl, Ralph Kennel

Abstract:

NULL

Keywords:

NULL

Published In:

Proceedings of the 5th International Conference on Clean Electrical Power, Taormina, Italy, NULL, NULL
On the design and operation of a standalone residential PV system in Egypt

M. Abdel-Salam, A. Ahmed, A. El-kousy, K. Sayed, M. Amery, M. Swify, M. Khalaf

Abstract:

NULL

Keywords:

NULL

Published In:

International Conference on Clean Electrical Power (ICCEP 2013), NULL, 659-664
Steady-state modeling and control of a microgrid supplying irrigation load in Toshka Area

M. Abdel-Salam, A. Ahmed, H. Ziedan, R. Kamel, K. Sayed, M. Amery, M. Swify

Abstract:

NULL

Keywords:

NULL

Published In:

38th Annual Conference on IEEE Industrial Electronics Society, NULL, 5689-5694
Encoderless model predictive control of doubly-fed induction generators in variable-speed wind turbine systems

Mohamed Abdelrahem, Christoph Hackl, Ralph Kennel

Abstract:

NULL

Keywords:

NULL

Published In:

Journal of Physics: Conference Series, 753-11, NULL
Aggregation of microgrids for irrigation in Toshka area

Mazen Abdel-Salam, Arif Ahmed, H Ziedan, R Kamel, Khairy Sayed, M Amery, M Swify, Hassan El-kishky

Abstract:

NULL

Keywords:

NULL

Published In:

Clean Electrical Power (ICCEP), 2013 International Conference on , NULL , 496-502
Analysis of protection system for a microgrid supplying irrigation load in Toshka Area

M. Abdel-Salam, A. Ahmed, H. Ziedan, R. Kamel, K. Sayed, M. Amery, M. Swify

Abstract:

NULL

Keywords:

NULL

Published In:

38th Annual Conference on IEEE Industrial Electronics Society , NULL , 5602-5606
DC-DC PWM Converter with High Frequency Link for Small Scale Fuel Cell

Mohamed Abdel-Sater, Khairy Fathy, Adel Ahmed

Abstract:

NULL

Keywords:

NULL

Published In:

Proceedings of the International Conference of Energy Engineering, NULL, NULL
Maximum power point tracking for variable speed grid connected small wind turbine

Mazen Abdel-Salam, Adel Ahmed, Mohamed Abdel-Sater

Abstract:

NULL

Keywords:

NULL

Published In:

IEEE International Energy Conference and Exhibition (EnergyCon 2010) , NULL , NULL
E cient Model Predictive Power Control with Online Inductance Estimation for Photovoltaic Inverters

Issa Hammoud, Khaled Morsy, Mohamed Abdelrahem, Ralph Kennel

Abstract:

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Keywords:

NULL

Published In:

Springer, NULL, NULL