Personal Information

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Profile Summary

Currently, I am a Future PhD student at the Electrical and Computer Engineering Department, Faculty of Engineering, University of Waterloo, Ontario, Canada, with strong communication skills developed from an extensive teaching experience and the ability to work independently or as a part of team.

Also, I have been working as Teaching and Research Assistant with the Electrical Engineering Department, Assiut University, Egypt since 2014, with (7+) years of experience in teaching different engineering syllabus based on both simulation programs and laboratory implementations. My main duty is to assist my professors in teaching the designated curriculum and assist my students with the laboratory experiments as well as helping them in solving the related problems. Also, I assess the assignments and reports and evaluating the students scientific progress via quizzes, mid-term exams and oral interviews.

Education

Assiut University	Assiut, Egypt
MSc degree in Electrical Engineering	August 2018

Dissertation: Analysis and Control of Linear Switched Reluctance Motor Drives.

Assiut University	Assiut, Egypt
BSc with First Class Honors in Electrical Engineering. Average Five Years Grading = 85%.	June 2013

Work Experience

Assistant Lecturer, Electrical Engineering Department, Assiut University   *October 2014-Present*

I have been working as an assistant lecturer since November 2014. I assist my professors in teaching different courses, both the theoretical syllabus and the experimental syllabus. Therefore, I have a good experience with the following courses: (1) Electrical Machines Analysis course, (2) Power Electronics course, (3) Electromagnetic Field course, (4) Process Control course, (5) Electric Circuits course, (6) Electrical Machines Drive course.

Electrical Engineer, Egyptian Ministry of Water Resources and Irrigation   *July 2014- October 2014*

I worked as an electrical maintenance engineer with the Egyptian Ministry of Water Resources and Irrigation, dealing with different problems related to the pumps driven by three-phase induction motor. During these three months, lots of motors' faults, low voltage switch gear faults, cables' faults and distribution transformers' faults have been experienced.

Electrical Engineer, Private Company for Electric Automation   *May 2014*

During this month, I dealt with the SCADA and PLC systems to maintain the generation station observability and controllability in the American University in Cairo (AUC). The task was to monitor the generators output power, temperature, etc. and to control them remotely via the PLC. I have dealt with SCADA InduSoft software and PLC Siemens software.

Final Year Graduation Project   *September 2012- July 2013*

The graduation project represented a detailed steady-state analysis of Three-Phase Induction Generator. Throughout the project time- interval, there were two main stages: (1) Prime-mover (simulated with shunt DC motor) speed control via a microcontroller unit (MCU) to adjust the generator frequency. The software of PIC "C" has been utilized to implement the MCU coding, (2) Capacitor banks switching control to adjust the generator voltage. Siemens PLC packages have been utilized to implement the voltage regulation adjustment.

Research Experience

Current research   *September 2019 - present*

Recently, Electric vehicles (EVs) have attracted the attention of industrial and academic researchers, particularly in the past ten years due to their high efficiency and very low indirect carbon emissions. However, the capital cost, the long-time of battery charging and the short-range obstacles are urgently needed to be tackled. A new trend aims to solve these dominant problems by the adoption of dynamic wireless fast charging (DWFC) technology. However, the DWFC has a bad effect on the grid, this includes the harmonic content, voltage deviation and grid components aging. Therefore, my research proposal suggests the smart integration of the renewable energy resources, particularly the PV energy, with the DWFC stations to improve the power quality of the utility grid. Firstly, the optimum design of the PV systems, the Energy Storage Systems (ESSs) and the DWFC pads based on the forecasting of the weather conditions, the traffic movement, the available power of the utility grid and the grid tariff is presented. Secondly, a proper energy management between PV systems, utility grid, ESSs and EVs, using advanced central control (CC) as a tool of forecasting and optimization is proposed. Finally, a new topology of power converter to improve the EV charging/discharging ability within the DWFC construction is suggested. A comparative analysis, simulation and experiments will be carried out to validate the effectiveness of the proposed methods.

Previous research   *September 2014 - August 2018*

I accomplished my Master of Science degree within the period from September 2014 to July 2018, including the preliminary studying year. During my research, based on MATLAB/Simulink package, two simulation models for three-phase Linear switched reluctance motors (LSRMs) were developed. The first simulation model neglected the saturation effect of the LSRM magnetic circuit, while the second simulation model considered the saturation effect of the LSRM magnetic circuit. Ansoft Maxwell simulation program was utilized to extract the magnetic data necessary for the simulation process. A new simple force sharing function (FSF) was proposed to mitigate as possible the force ripples problem related to the LSRM.

A proposed adaptive hybrid Fuzzy-PD controller for pick and place LSRM was developed to realize an acceptable position tracking response. Also, the design of a proposed adaptive hybrid position controller was developed based on fuzzy reasoning and rules. Ant colony optimization (ACO) algorithm and fuzzy logic reasoning were utilized to provide systematic steps to instantaneously adjust the adaptive position controller parameters.

The LSRM can't be fed directly from photovoltaic (PV) array with tracking the maximum power point (MPP) at the same time. This is due to the continuous variation of LSRM drawn current, even under steady-state operating condition. So, a systematic solution was proposed to solve this problem, including the problem of LSRM adaptivity against different external mechanical and electrical disturbances. Officially, two research papers have been published in MEPCON which is an international conference sponsored by IEEE organization. These two papers can be easily tracked using the following references:

(1) G. El-saady, E. A. Ibrahim and M. Abuelhamd, "Hybrid PD-fuzzy position controller for linear switched reluctance motor with online fuzzy logic gain scheduling of PD," 2017 Nineteenth International Middle East Power Systems Conference (MEPCON), Cairo, 2017, pp. 830-838.

(2) G. El-Saady, E. A. Ibrahim and M. Abuelhamd, "Hybrid PD-Fuzzy controller for high performance linear switched reluctance motor under different operating conditions," 2016 Eighteenth International Middle East Power Systems Conference (MEPCON), Cairo, 2016, pp. 437-444.

Computer and Language Skills

Computer: MATLAB/Simulink, Finite Element Method Magnetics (FEMM), Ansoft Maxwell (ANSYS), DIALux, InduSoft, TIA Portal, Microsoft Office, Latex.

Language: English (IELTS Score: Overall (6.5), L7, R6.5, W6, S6).