

Name: ALI MAHMOUD

Program: ELECTRICAL ENGINEERING

Statement of purpose for PhD admission

I am a senior postgraduate student in the Department of Electrical Engineering at the **SIKSHA 'O' ANUSANDHAN (DEEMED TO BE UNIVERSITY)**. I am seeking admission to PhD program in Electrical Engineering at the **Indian Institute of Technology** with Power Supply using Microgrid as my specialization. Through this statement of purpose, I intend to put forth my personal and educational background, research interests, goals and reasons for choosing your esteemed Institute.

I did my undergraduate studies in Electrical Engineering at **Tishreen University, Syria**. During my undergraduate studies for five years (2012-2016) the excellent course structure coupled with high academic standards further simulated my interest in the field of power Electronics and Power system. A clear manifestation of my genuine interest is my continuously increasing GPA and my consistent good performance in the courses related to *Power system, Power Electronics converters and Simulation of Electrical System*. I have a **CGPA of 84.17% on a scale of 100**. My graduate project was about **Design 3-Phase Inverter Sine Wave controllable in voltage and Frequency with MPPT charger**, under the **guidance of Prof. Fouad Jabal**. I won the best project award during my participation in the Fifth Applied Projects Exhibition of the Faculty of Mechanical and Electrical Engineering, according to the scientific committee and the visitors of the exhibition who are specialists in the fields of industry and electricity. In addition, Tishreen University purchased the project and its equipment to place it as one of the teaching equipment in the Power Electronics and Electric Driving Laboratory. In this project, I designed all part in my hand, the first one is flyback converter which convert the voltage from (10 – 20 Volt DC) to (450 -720 Volt DC) , second one is inverter part and firing circuits to convert DC power to AC power with measuring current and voltage for feedback controller and protection in the first and second part I used Atmel Atmega2560 controller and had programmed it using Assembly and C language, also the third one is MPPT Charger (buck converter with sensors voltage current temperature) I used B&O algorithm to track the maximum Power with PIC 18F4550 controller using C programming language.

I am doing M. Tech now in Electrical department at **SIKSHA 'O' ANUSANDHAN (DEEMED TO BE UNIVERSITY)**. For further development of my keen interest and deeper understanding of the field of Electrical Engineering, I have tried to use Neural Network in my M. Tech project, which is **Energy management in standalone and grid connected hybrid energy system under the guidance of Prof. Renu Sharma**. In this project first, I putted my plan (four microgrid have different type of sources and changing load) also studied Control strategy in microgrid and their application in power sources sharing where I use Neural Network Control to control in frequency and voltage of microgrid also I used traditional control to regulate energy sharing between the four microgrid ; second, I'm working on hardware part four virtual microgrid each one has a controller ATmega2560 and the main controller which is STM32H743 based on ARM Cortex.

As part of my future PhD work at your university, I plan to work on Micro-grid and smart grid control strategies and designing a home device for the gradual shift from traditional utility to smart or micro grids, by benefit from the graduation project and the master's project.

I chose **Indian Institute of Technology** to complete my PhD research because this institute is recognized worldwide as a leader in the field of engineering education and research. In addition, the institute has an outstanding faculty, many of whom are reputed for their research contributions internationally. More specifically, The Electrical Engineering Department is at the forefront of the academics and it has a very vibrant postgraduate program with a strong focus on research and development.