مشاريع الخطة الجديدة الترم الأول العام الجامعي ٢٠٢٠ـ٢٠٢١

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Comparison between the Different Types of DC Electrical Machines and Adaptive Speed Control for This Machines	Project 1	١
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COLLEGE OF ENGINEERING
Department OF Electrical Engineering

Proposal (1)
Comparison between the Different Types of DC Electrical Machines and Adaptive Speed Control for This Machines

1- Introduction & Background

Machine Control (Using Power Electronics) system, this, include`:

Electrical Machine, Adaptive control system, Drive Circuit (PWM), Converter, Feedback Systems, Electronic Control, Electrical Engineering, …. and so on.

This project solving the comparison between for dynamic analysis of different types DC electrical machines and the proposed design problem of speed controller for the electrical motor. The controller look up table for armature voltage value is solved by used true and error method to search for optimal voltage values. The controller is designed to overcome difficulties estimating control variables and motor operation over a wide range of speeds. And this proposed is design the Drive Circuit for Converter by used PWM (Pulse Wades Modulation) technique. The controller is designed and implemented by computer simulation. The performance of the motor with the controller is assessed using dynamic loads and various types of disturbances. The results illustrate that the controller represent an ultimate solution for the operation of the electrical motors.

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Proposal (2)

Design and Simulation of Speed Control of dc Motor over wide range

1- Introduction & Background

Today the high performance dc drives is very important for industrial applications. A high performance motor drive system must have good dynamic speed command tracking and load regulating response. DC motors provide excellent control of speed for acceleration and deceleration.In this project a practical model will be developed to run a separately excited direct current (d.c) motor using a single phase alternating current (a.c) source by converting the a.c source into variable d.c source using a buck converter. Pulse Width Modulation (PWM) based rectifiers are efficiently employed in low to medium power applications. Since the step down converter can produce control dc input voltages to the motor from zero voltage up to the motor rated voltage then the motor speed can be controlled over wide range.

<p style="text-align:center">**Proposal (3)**</p>

<p style="text-align:center">**Design of a Footstep Power Generation model**</p>

1- Introduction & Background

- The goal of designing Footstep Power Generator circuit comes from the utilization of waste energy of foot power with the human motion for highly populated regions and the electrical generator itself. The circuit has many advantages as the simply walking on step, no need fuel input, non conventional system, no moving parts-long life services, self generation and no need of external power, and compact yet and highly sensitive. In this project the students will be able to design a generator circuit to be applied in home, street lighting, agriculture, railway stations.. Also the students will be able to formulate mathematical identities including all interested parameters with the use of MatLab programming.

2- Problem Statement and Objective (ABET – 3e)

The main objectives of this project as follows;

- Basic of piezo sensors.

- Principles of unidirectional circuits.

- Principles of circuit model.

- Inverters and batteries

3- Problem justification and Outcomes (ABET - 3e)

In this project the students will experienced to the main problems of designing piezoelectric generation model. These problems are classified into two sides, the first side is related to the experimental designing. The experimental problems include the cost of equipment necessary to convert the kinetic energy into electrical energy. The other side concerning the case of theoretical design, the problems come from the student background concerning mathematical problem formulations including all interested parameters. It is planned to avoid these problems by using Matlab simulation.

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Proposal (4)

Design of Solar Panel Data Monitoring based on Arduino and LabView

In Saudi Arabia, fossil fuel consumption is associated with electricity production to meet country demand which increase. This growing domestic demand for electric power constitutes a vital problem facing the nation. To overcome this challenge, renewable energy resources would be considered as one of the most important solutions to address this challenge which also responds in addition to different social and economic issues.

The capability of Photovoltaic panel is that it can convert into electrical energy from the plentiful and free solar energy. Also, any adverse forms of pollution are not generated which may affect our atmosphere.

This project proposes a system based on LabVIEW and Arduino to characterize a Photovoltaic panel and for monitoring its output data (current, voltage, and power) under real condition. A Photovoltaic panel, Arduino UNO board, voltage, and current sensors are used as hardware components. Arduino IDE and LabVIEW are used as the software of the system design.