CHAPTER 1

INTRODUCTION

1.1 BACKGROUND OF THE STUDY

Recently, solar energy has given more and more attention, it is a clean and renewable energy sources. The Photovoltaic (PV) cells are attained to convert solar energy from the sunlight directly to electrical energy. This energy can be utilized in many applications, like lighting, heating and performing different devices. The sun powered cell is containing semiconductor physical which utilizing the photovoltaic impact. At the point when the daylight is opposite to exterior of the PV sun powered board, can acquire higher efficient system; therefore, maximum potential electrical energy can be established. Many experimentations have been done to boost the efficiency of the solar cell.

Few decades ago, solar cell modules have been created and have been invented by arranging in series to optimise the output voltage. Solar tracking system categorizes as a control system that consists of sensors to detect either the sunlight is upright to the PV panel or not, and a controller that deliver signals to one or more actuator for changing the panel to the maximum targeted position. Nowadays dual axis solar tracker mechanism gained interest in R&D field due to the evidence of gain at the efficiency of the PV panel. Presently the researchers practising the usage of dc-dc support converter to coordinate the yield voltage as well as boost the lower voltage from system of photovoltaic. The purpose of using dc-dc boost converter is to boost low output voltage to high output voltage and also avoids the reverse current flow by blocking diode.
Furthermore, the Pulse-width Modulation (PWM) approach is also providing by researchers to regulate the dc-dc support converter. The Extreme Power Point Tracking or MPPT method obtains maximum extreme potential force from sun oriented boards. An intelligent controller is required to support the proficiency of the control framework of PV together with mechanical model of tracking structure. One of the MPPT method is fuzzy logic controller which is very reliable for photovoltaic array because fuzzy logic technique is promoted better and rapid tracking effectiveness for different optimal operating points. It supports to record optimum power under weather surroundings changing and gain great strength plus feedback amount is big. Progressively, data acquisition (DAQ) is process of recording or storing the data of output voltage from solar panel to compare with different weather conditions.

1.2 PROBLEM STATEMENT

Usually, a solitary sun based cell can't be connected straightforwardly to the heap on the grounds that it has less output voltage and less energy conversion efficiency. Furthermore, the output voltage covers by solar emission and temperature as well. Many solar cells that build in series to generate the maximum output voltage leads to high expenses to fix the photovoltaic system. In conjunction, large surface area is required for sufficient electricity and competence system. The data of output voltage from solar panel is required to record the different weather conditions.

1.3 OBJECTIVES OF THE STUDY

i. To design the model of sun tracking scheme.

ii. To execute the fuzzy logic controller using Arduino to trace and create extreme output power of the sun powered cell also used for managing output voltage by dc-dc boost converter.

ii. To record effective data of output voltage from solar panel.
1.4 SCOPES OF THE STUDY

i. The monocrystalline silicon solar panel is the solar panel selected for the project.

ii. The boost converter obtains developed using MOSFET, diode and more convenient components.

iii. The performance of the fuzzy logic controller by using the Arduino Uno Rev3.

iv. The Arduino terminology which is set in C or C++ created the fluffy rationale programming in order to build equipment.

v. The data acquisition system is designed by voltage sensor and current sensor.