2.1 Project Background Fossil fuels have been facing reduction with passing time and generation of power is becoming a bigger challenge.The automatic solar tracker produces more power compared to the static solar panel.It is calculated that the efficiency for the automatic solar tracker is better than the static solar tracker for about 32.17%.Design, Development and Control of Dual-Axis Solar Tracking System [5] INTERNATIONAL JOURNAL of RENEWABLE ENERGY RESEARCH, Published by Ahmad Afghani, Nezar Qudah, Deviprakash Jyothishmathi, Tom sunny, Taha Tabazam Amjad Alsakarneh The maximum energy gained from PV panels is when the solar beam is perpendicular to it as the sun is moving one degree every four minutes and between year seasons.[6] School of Mechanical Engineering, Shanghai Institute of Technology, Shanghai, China Searchers: Huilin Shang and Wei Shen This study was designed and constructed to enhance solar radiation yield.Though the Finster solar tracker realized insignificant energy gains, years of testing and research have led to improvement of the conversion output of the PV system and consequently the emergency of different tracking technologies and applications (e.g. concentrator and non-concentrator).[5] Fuzzy control based solar tracker using Arduino Uno Dipti Bawa, C.Y. Patil Department of Instrumentation and Control, College of Engineering, Pune.Due to the benefits that would be obtained via the utilization of the designed solar tracking system, certainly fewer PV panels will be applied to it in proportion to the merits obtained using fixed panels.This study results showed improvement of the efficiency to almost double using dual axes tracking system in comparison to fixed PV panel, where an increasing of 76% and 41% have been recorded during the summer and winter solstice, respectively.K.S. Madhu et al., (2012) International Journal of Scientific & Engineering Research states that a single axis tracker tracks the sun east to west, and a two-axis tracker tracks the daily east to west movement of the sun and the seasonal declination movement of the sun.In Shanghai, China, where the experiment was conducted, 24.6% more energy was obtained from the solar panel that tracked the sun on two axes when compared with that of the 30o tilted fixed-surface panel.The automatic solar tracker has the higher average power with 3.31 W while the static solar panel only has about 1.994 W. solar tracker has an advantage because it uses servomotors as the driving devices for a solar panel to give a much higher performance and less power consumption compared to the old stepper motor.Talking about renewable sources, the conversion of solar energy into electrical energy by using photovoltaic panels is prioritized.However, with mechanical or electro-mechanical systems, the orientation of the collector changes continually in reference to the azimuthally directions (east-west) and also in its elevation.The power in fixed axis is 1178 Whr every day for 100 Wp, whereas, the power of the dual-axes solar tracking system is 2082 Whr, also for 100 Wp solar, which means the increasing in power about 76%; i.e. 904 Whr per day in summer season.For the fixed axis, the total energy collected is 633 Whr per day for 100 Wp solar, while the dual axis solar tracker collected 1532 Whr per day, which means the power increased about 41%.Stepper motor used for the direction control gives a precise position control and MPP is tracked efficiently throughout the day with the change in sun/panel position.Development of Automatic Solar Tracking System for Small Solar Energy System.[7] Musse Mohamud Ahmed1 *, Mohammad Kamrul Hasan1, and Mohammad Shafiq.In fixed photovoltaic system the solar receiver (PV module) is in a stationary position facing the true north.According to the results of these measurements, the prototype solar tracker functioned as expected, specifically for

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small–sized solar panels.The watts delivered by the solar panel are directly proportional to the relative angle of the sun in reference to the earth.In this regard the efficiency of the PV panel can be increased by using solar tracking system.The dual axis is a system that includes both a horizontal and vertical axle.Concentrates solar power systems use lenses or mirrors and tracking systems to focus a large area of sunlight into a small beam.Haneih (2009) conducted a study in Amman Jordan focusing on the demand of the sun tracking for solar panels.The author explained that by using part of the power output of the solar panel two degrees of freedom orientation can be achieved.The author further explained that special consideration should be given to the grid arrangement of panels in the collecting plants.Results and Discussion By using the voltage and current recorded by the data logger, the power was calculated in summer and winter seasons, respectively.It is known that the solar radiation in winter is less than summer as a result the power generated by the PV panel will be decreased.Department of Electrical and Electronics Engineering, Faculty of Engineering, University Malaysia Sarawak.This study basically discussed about increasing efficiency of PV panels in dessert regions.If we consider the symmetry of the system, the kinematics of the system can be controlled using astronomic calculation.9 shows the power–time relation of dual axis solar tracker and fixed axis solar panel.Hence, the designed system will be more economical regarding the number of PV panels used, which will decrease the investment cost 7.The automatic solar tracker has the higher average power of 2.41 Watt while the static solar panel only has an average power of about 1.818 Watt.Thus, the delivery of the watts is reduced when tis relative angle changes.The main types of tracking systems are either a single axis solar tracker or a dual axis solar tracker.The first solar tracker was a mechanical system by C.Finster, invented in 1962.In short, improved solar cells have been developed and the use of solar tracking system over the use of conventional fixed PV system has grown.Solar tracking sensors and feedback control loops can be used to add close loop control to the system.Design and Implementation of a Dual–Axis Solar Tracking System.The automatic solar tracker has the higher average power with 3.31 W while the static solar panel only has about 1.994 W.The pay load is moved towards the sun by solar trackers throughout the day.The single axis system depends on a single horizontal or vertical axis.This is dependent on the tracker's geometrical capacity.Test results indicate that the increase in power efficiency of tracking solar plate in normal days is 26 to 38% compared to fixed plate.And during cloudy or rainy days it's varies at any level.For that reason, the proposed investigated the effectiveness of tracking system during winter time, Fig.[4] Result: increases the efficiency of the overall system by 33.416%.The advantage of the fuzzy logic control is that it does not strictly need any mathematical model of the plant.An extensive analysis of the total daily energy collection of the system was performed.This project highlights different forms of tracking system as well as their pros.The direction of the axis is based on the location of the system where it is going to be placed.2.2 Previous work 1.In Summer Season, Fig.This type of tracking system can track the motion of the sun exactly around the world in any location.[1] 2.[2] 3.[3] 4.10.6.

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