YILDIZ TECHNICAL UNIVERSITY



PV & EV

PHOTOVOLTAIC & ELECTRIC VEHICLE

WHAT IS PV & EV ?



PV (PHOTOVOLTAIC), CAN CONVERT PHOTON ENERGY TO ELECTRICAL ENERGY DIRECTLY

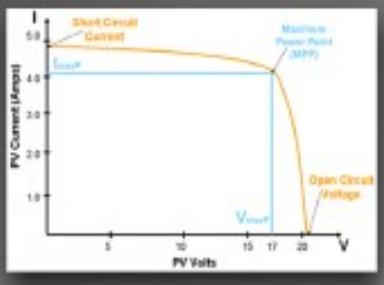


EV (ELECTRIC VEHICLE) IS A VEHICLE THAT DRIVEN BY AN ELECTRIC MOTOR

EV WITH PV

ELElectrical vehicles are being thought as the future of the vehicle technology. If the surface of the electric vehicles could be covered by photovoltaic cells, it is possible to store considerable amount of energy in the battery system of these vehicles.

MPPT'S



MPPT'S

According to alternations on environmental effects such as solar radiation, temperature...etc, the point of the maximum power varies along voltage curve. Maximum Power Point Tracker (MPPT) systems are used under these environmental variations to maximize the amount of power that is supplied by photovoltaic systems to battery or load. MPPTs are not mechanical systems like sun trackers. They are electrical circuits which have electronic components to maximize the amount of energy that is transferred to load.

MPPT ALGORITHMS FOR EV

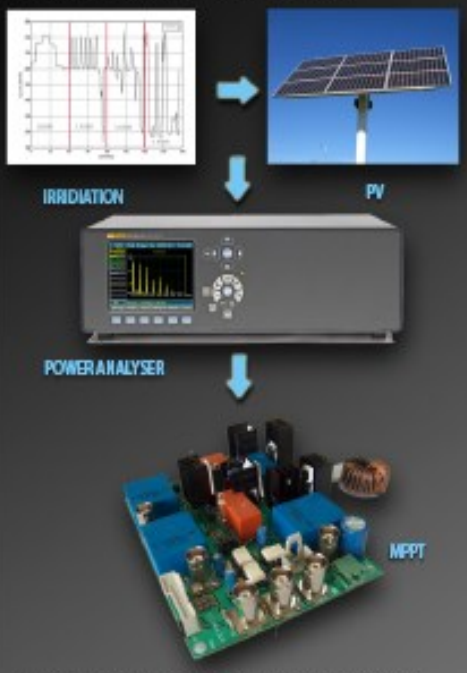
MPPT systems have both hardware and software parts. Generally hardware components of MPPT systems have DC/DC converter, sensors and control unit. As a hardware component control unit has software on its memory. This software has a specific algorithm to track the maximum power point.



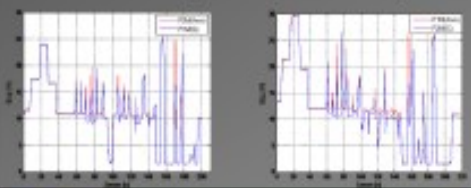
However these algorithms have been developed for the stable photovoltaic systems. Variations on environmental conditions around dynamic systems such as vehicles are very quick thus conventional algorithms are inadequate to transfer the maximum power. Therefore a specified MPPT system should be designed for the cars which are covered with photovoltaic cells.

METHOD

In this project, developing a novel MPPT specified for electric vehicles which has multiple inputs and updated algorithm is determined. The MPPT that is designed with these qualifications is 7% more efficient than the MPPTs for stable systems designed domestically.



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References

Project No: 29-0402-KAP02
Project Name : The performance measurement of maximum photovoltaic power tracker in moving systems under fast-changing load conditions and constitution of an effective algorithm

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