Proposed Area and Topic of Research

Name of the Candidate : AMJITH S

Field of Research : POWER ELECTRONICS

Proposed title of the work:

Modelling of system components for Vehicle-to-Grid (V2G) and Vehicle-to-Home (V2H)

Research problem:

The problematic of the Plug-in Electric Vehicles charging costs in housing sector. A review of the optimal strategies is proposed and as such six algorithms are presented: three smart unidirectional and three smart bidirectional charging algorithms where the Vehicle-to-Grid and the Vehicle-to-Home concepts were exploited. In addition an innovative V2G algorithm named Optimal Logical Control (V2G-OLC) is introduced in this project..

Scientific background:

Developed countries promote the Plug-in Electric Vehicles (PEVs) which are rising. Today, many car manufacturers are embedded in PEVs. It is expected a consequent rise of vehicles with bidirectional on-board chargers in the market. This will make possible V2G and V2H concepts.

Novelty:

Early works in stroke area concentrates on the stroke detection and classification only. But this method helps the doctors to detect, segment, classify and to point out the exact position of the hemorrhagic stroke which again helps the doctors for the improved treatment of the disease. This method would help the radiologist and the doctors to analyse CT data without misdetection and misinterpretation by considering the HU value. Research on the PEV/Grid topic is now focused on Vehicle-to-Grid (V2G) and Vehicle-to-Home (V2H) concepts with various aims based mainly on economic aspect. PEVs are used to support the grid frequency thanks to V2G. In this same theme aspect, PEVs are also used to mitigate potential overloads in the distribution system and to minimize charging costs during the same operation.. Grid components are still at the heart of the research activities. As such, a centralized model to co-optimize the transformer loss-of-life with the benefits for PEVs' owners on charging/discharging management was proposed. Peak shaving with PEVs is also implemented, proves the possible profits in decrease of home peak load with customer costs together and presented a two-stage mechanism for peak shaving coupled with renewable energies.

Objectives:

The main objective is to modelling of system components for Vehicle-to-Grid (V2G) and Vehicle-to-Home (V2H)

Methodology:

The flow chart of proposed method is shown in Figure: 1. The proposed method is divided into four steps; namely, preprocessing, segmentation, feature extraction and classification.

Research time plan(Chart):

Figure: 1 flow chart of proposed method

Stages of Research	0-6 months	6-12 months	12-18 months	18-24 months	24-30 months	30-36 months
Selection of topic						
Literature Review						
Research methodology plan						
Selection of appropriate research techniques						
Analysis						
Findings and recommendations						
Data Compilation, Publications and Final Report						

Possible outcome:

The majority of the possible strategies in the context of the charge of one vehicle associated to one house. The common aim of all the optimal algorithms is to reduce the charging cost of the vehicle.

References:

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Hybrid Electric Vehicles (PHEVs)," in *IEEE Transactions on Power Delivery*, vol. 27, no. 3, pp. 1323-1331, July 2012.