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Review On Accumulator and Power Transmission in Ev Go-Kart

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ABSTRACT:

This paper gives an overview of a cognizant strategy while selecting the major components of tractive system and power conveyance of Ev go-kart and the importance of each of the factor and their effects upon the performance. We have also considered the battery management system, motors, and other electrical management systems along with a brief description of their working and specifications. Through detailed analysis of the tractive system components such as motors, controllers, batteries, and drivetrain configurations, this research seeks to identify key parameters influencing the overall performance and acceleration characteristics of electric go-karts.

Keywords — Go-Kart, Battery, Controller, Acceleration, Environment

Literature Review :

[1] C.C.Chen

An overview of the present status and future trends in electric vehicle technology is provided. The emphasis is on the impact of rapid development of electric motors, power electronics, microelectronics, and new materials. Comparisons are made among various electric drive systems and battery systems. The market size of electric vehicles in the coming years and the potential electric vehicle impacts are discussed.

[2] C. Cardoso, J. Ferriera

In this paper we present an electric go-kart suitable for an instructional laboratory in electric drives. An overview of propulsion system design, power conversion structure and control are presented. A three-phase squirrel-cage induction motor is used as a propulsion system. The motor is controlled at different operating conditions by means of a simple scalar control using a low-cost controller board developed for light electric vehicles used in local areas. The prototype has been designed specifically to meet the requirement of low cost and it contains all of the active functions required to implement the control of the go-kart.

[3] F. J. Perez-Pinal, C. Nunez

The main purpose of this paper is to present a step-by-step design procedure of an experimental EV powered by two electronically independent controlled induction machines. Additionally, efforts are focused to develop high-performance, low-price traction system with low losses needed in the propulsion system. Emphasis in developing an EV it is based in its high efficiency (above 80%) compared with HEV (60%) and ICE (30%) technology.

[4] J. M. Lee, B. H. Co

The electrical power system (EPS) of an electric vehicle consisting of batteries, the motor and driving subsystem, has been modeled. A battery is modeled with an electrical circuit representing the features of a real battery. The driving subsystem is modeled as three different levels, that is, exact, average and functional models. The load profile includes road information, speed profile and EV mechanical parameters, which are incorporated into a reference torque in the driving subsystem model.

[5] M. Xianmin

According to vehicle's dynamic characteristics and dynamics principle, the computer simulation model of electric vehicle (EV) is proposed to improve the design method for the propulsion drive system of electric vehicles. Mathematical models for every component in EV can be modeled in the corresponding blocks, and the transfer function of each block for simulation in MATLAB software environment is introduced. The suggested method is verified through design of an electric sedan in MATLAB environment, and may be useful reference in applications of design, control and simulation of electric vehicles.

[6] Y. Ding, Z. Cano

Lithium-ion batteries (LIBs) are currently the most suitable energy storage device for powering electric vehicles (EVs) owing to their attractive properties including high energy efficiency, lack of memory effect, long cycle life, high energy density and high-power density. These advantages allow them to be smaller and lighter than other conventional rechargeable batteries such as lead–acid batteries, nickel–cadmium batteries (Ni–Cd) and nickel–metal hydride batteries (Ni–MH).

[7] L. Ahmadi, S.B. Young, M. Fowler

Purpose Lithium-ion (Li-ion) battery packs recovered from end-of-life electric vehicles (EV) present potential technological, economic and environmental opportunities for improving energy systems and material efficiency. Battery packs can be reused in stationary applications as part of a "smart grid", for example to provide energy storage systems (ESS) for load leveling, residential or commercial power. Previous work on EV battery reuse has demonstrated technical viability and shown energy efficiency benefits in energy storage.

[8] Aniket Rameshwar Gade

In electric vehicles, batteries are the primary source of power. The batteries we use in electric vehicles are not that efficient and require charging after a few miles. So here is the idea of a new battery management system. This study presents a comprehensive overview of this relatively revolutionary and gratifying solution for battery difficulties in electric vehicles, as well as an in-depth investigation of it. In this new battery management system, we divide the battery into two halves. One half is for charging and the other half is for discharging.

[9] A. Hariprasad, Priyanka, V. Sandeep

Here this document provides the data about the batteries of electric vehicles. It consists of numerous data about various energy storage methods in EVs and how it is different from energy storage of IC-engine vehicles. How electric vehicles will take over IC Engine vehicles due to advancement in battery technology and the shrink in its prices. Various types of batteries are listed in the document with their specifications. Possible future battery technology which will have more or same energy density than current gasoline fuels.

[10] Ananthraj C R

Battery storage forms the most important part of any electric vehicle (EV) as it stores the necessary energy for the operation of EV. So, in order to extract the maximum output of a battery and to ensure its safe operation it is necessary that a efficient battery management system exist i the same. It monitors the parameters, determine SOC, and provide necessary services to ensure safe operation of battery. Hence BMS form a important part of any electric vehicle and so, more and more research are still being conducted in the field to develop more competent Battery Management System.

[11] Gheorghe Livint

Energy storage systems represent a critical role in power supply of electric vehicles (EV) and lithium-ion batteries is the most promising and dominant energy storage choice. Because of cell variations in a battery pack, it is hard to obtain an accurate model to study the behavior of lithium-ion cells and in many situations different algorithms must be used to estimate state of charge. Several techniques for SOC estimation have been studied in the last years. These methods can be classified in three categories: direct methods, data-driven methods and state-observation methods.

[12] Mohanapriya V

Most common man would think Electric Vehicles are the future, but it is not, Electric Vehicles are here and as we push importance of green energy in the present world EVs are becoming the best choice for environment. And the most important thing in Electric Vehicles is Battery Management System (BMS). Our proposed work is helpful in selecting more suitable ways to origin of a trusted and Safe BMS. To maintain reliability and safety of battery we are going to use Lithium-ion battery which is preferred Over Lead acid battery. If not operated within safety, Lithium-ion batteries can be dangerous.

[13] Jeevak S. Lokhande

The most basic component in the Electric Vehicle is the Battery, that acts as a main source of energy and gives it mobility which is sustainable. In electric vehicles, the technology which is highly acknowledged and used for energy storage is based on Lithium chemistry. However, there is scope for research is still open. This includes the selection of the materials for cell manufacturing. The development of algorithms and designing of electronic circuits for a better and effective utilization of the battery is also one of the areas of research. **https://ieeexplore.ieee.org/document/9142869**

[14] Saurabh Shah

Battery is the heart of electric vehicle and a way of improving the battery life is to equalize the energy of its cells. This can be done by either dissipating excess energy in the form of heat (passive cell balancing) or charging the low voltage cells through high voltage cells (active cell balancing). This paper presents a practical approach of active cell balancing along with a brief comparative study of passive and active cell balancing techniques. To improve the inconsistency, present in the series-parallel connected lithium ion (Li-Ion) cells, a cell balancing scheme based on switch-matrix and forward converter with active clamp driver topology is presented.

[15] Parikshith Savanth

Lithium-ion battery is generally used in the Electric Vehicles, and it becomes necessary to build an efficient model and simulate it to obtain the characteristics of the battery. To build a battery model, first a cell model has to be built, upon which the entire battery model can be formed. The goal of this paper is to build a Lithium-ion cell ($LiFePO_4$) model from the available data and to simplify it, thereby obtaining a simpler model upon which the entire battery model and the charging system can be designed.

[16] S. Sakunthala

This review paper gives a brief description of the performance and comparisons of Brushless DC motor (BLDC) and permanent magnet synchronous motors (PMSM) drives. Both the electrical machines BLDC and PMSM have many similarities, but the basic difference is BLDC has Trapezoidal Back EMF and PMSM has sinusoidal EMF. These two machines have different characteristics. These two electrical machines are low cost and can be used in many industrial applications.

[17] R. M. Pindoriya

This paper discusses the relative analysis of permanent magnet motors and switched reluctance motors (SRM) capability of electric vehicles (EVs) and hybrid electric vehicles (HEVs) system. Nowadays the pollution of the environment is increasing due to conventional vehicles. Hence, to reduce the pollution electric motors are very beneficial. Presently use of high-power density magnetic motors like brushless DC (BLDC) motors and permanent magnet synchronous motors (PMSM) have been the primary choice in the EVs and HEVs.

[18] Mohan. S

The PMSM is widely used in industrial applications. There are two kinds of PMSM: interior PMSM, and surface mounted PMSM. I have considered myself an interior PMSM in my research. IPMSMs are typically used in electrical vehicles, and the flux barrier within the rotor produces a major issue with motor torque performance. According to this research paper, flux barriers are used on the rotor side of PMSM motors to improve torque performance and reduce cogging torque.

[19] Kalpana Chaudhary

The integration of fuel cell technology with Permanent Magnet Synchronous Motor (PMSM) drives holds immense potential for advancing electric vehicle technology. This work provides an overview on operation of “Fuel Cell Fed PMSM Drive for Electric Vehicles” by highlighting its key aspects and implications. In this paper, an enhanced DC-DC boost converter that offers more gain than a standard boost converter for the same duty cycle is presented.

[20] Yubin He

The longer electrical lifetime and higher reliability of AC contactors are forever demanded for industrial customers. It is known the occurred failure events of contactors are mainly caused by the long-term arc erosion of contacts. However, the determination of sensitive parameters and associated degradation process are still hot topics in this field.

[21] Zhang Qiang

The control system of new energy electric vehicles generally uses low-voltage batteries for power supply, including contactors that control the on-off of power lines. For this reason, contactors in cars are usually driven step up-down converters. This article compares and analyses the driving schemes

between constant-type current, stepped-type current, and curved-type current by modelling and simulating the electromagnetic mechanism of the contactor.

[22] Dongmei Yuan

In order to test torsion performance of automobile drive shafts, a new type of torsion testbed of automobile drive shaft is developed. The actual running condition of drive shaft is simulated completely by the angle adjusting equipment of testbed, and the pulse loading device combines machine, electricity and hydraulic, which has the characteristic of agility, smoothness, and reliability.

[23] Artem Ermolaev

This paper discusses the methods of analysis of the active power oscillations that occurred in a motor drive propulsion shafting system under variation of the rotational speed and load condition. The oscillation in the supplied active power generates the system vibration and increases the drive motor loading. It has been shown that the installation of the vibration dampers significantly improves the system performance and decreases the influence of the active power oscillation particularly at resonance frequencies.

CONCLUSION :

This research project has demonstrated that by using an engineering systems approach, TRACTIVE SYSTEM AND POWER CONVEYANCE OF EV GO-KART is optimized and well concentrated. Almost every calculation was covered and how to select different components based on the parameters and their connections. Through this study, a comprehensive approach is developed. This will allow the methodology changes and provide the basic work for the tractive system and power conveyance.

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