

Electric Bike

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Abstract- Electric Bike is popular mode of transportation due to their ease of use, mobility, health benefits and ecofriendly use. Their drawbacks however include a low distance range, safety concerns in urban areas and increased effort compared to a car. A fully sustainable hybrid electric bike will be created which will not only recover regular bicycle's drawbacks but includes features to it to make it more appealing to people that normally would not consider commuting on a bike. A normal throttle control however will be included for when the user decides not to use this feature and rely solely on the motor for torque and power. For safety concern of rider; headlamps, tail lights, a horn, LEDs and turn signals will be included. The bike will be made from lightweight aluminum with custom brackets.

Keywords- transportation, hybrid, motor, torque, power, throttle, lightweight, etc

- rely on the motor completely
- pedal and use the motor at the same time
- pedal only (use as a conventional bicycle).

III. BLOCK DIAGRAM DESCRIPTION

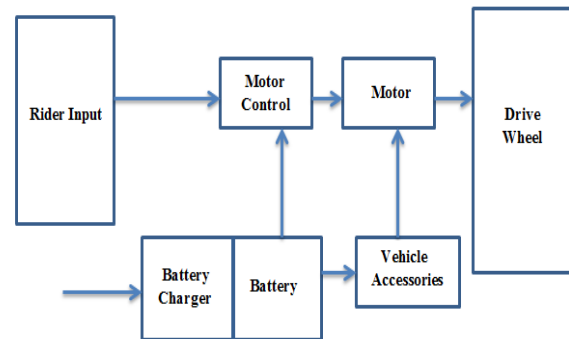


Fig No-1: Block Diagram

These Block Diagram is “ rely on the motor completely ”. The Rider gives input by controlling the throttle. The throttle signal is given to the motor control unit where PWM speed control is used to control the speed. The rechargeable battery is supplying power to electric motor and other accessories includes LED Light, Horn and mechanical braking system, etc.

I. INTRODUCTION

These paper gives knowledge of various components required to build the Electric Bike. Electric motor powered bike have been making their way into the market for about last decade. Electric bike can be used for a many purposes, for instance, law enforcement in cities where parking and traffic are a problem, as a guide bike during bike races, as a park ranger vehicle, or for rides and commuting purposes. Electric bike uses electric motor, battery, controller and throttle for its acceleration. Generally, various control schemes are used for control the speed of E-Bike but mostly PWM control is used.

II. EVALUATION OF THE STATE OF THE ART

Electric bikes have been gaining increasing attention worldwide, especially in US, China, Europe, Japan, and India. Electric Bike include lower energy cost per distance travelled (1–2% of going by car when going by electric bike) for a single person; savings in other costs such as insurance, registration, parking, traffic flow; environmental friendliness and the health benefit for the rider. The basic configuration of an electric bike drive consists of a controller that controls the power flow from the battery to the motor. The rider of an E-bike can choose to

IV. PROPOSED SYSTEM

Motor Type	<ul style="list-style-type: none"> ➤ Brushed dc machine ➤ Brushless dc machine
Motor Assembly	<ul style="list-style-type: none"> ➤ Gear ➤ Hub ➤ Friction
Throttle Type	<ul style="list-style-type: none"> ➤ Thumb throttle ➤ Twist throttle ➤ Push button
Motor Placement	<ul style="list-style-type: none"> ➤ Front wheel ➤ Rear wheel
Battery Type	<ul style="list-style-type: none"> ➤ Lead acid ➤ NiMH ➤ Others

Criteria for classification of electric bike have been determined such that they are independent of the purpose of use. These are the bicycle kit type, motor type, motor assembly, throttle type and battery type. Both brushed and brushless dc motors are used by manufacturers of electric bike but, as far as the synchronous motors and induction motors are not being used. Even though technical aspects do exist, the throttle types depend largely on the rider's personal preference. Different practicability criteria

PRACTICABILITY CRITERIA

Speed Control:

Speed control is done by PWM control method controller is used for controlling average voltage of the motor. When average voltage or duty cycle increases based of the motor increases hence the speed of the bike. Duty cycle changes by using the throttle i.e. accelerometer.

Technical Maturity:

- Technical performance is improving, more work is needed to be competitive with other vehicles.
- More research is needed on lifetime of electric bicycles.

Battery Charging:

- Long charging time; typically four hours
- Sparse availability of charging stations; recharging can often only be done at home.

V. RELATED WORK



Fig No-2: Project Model

The electric bike performance evaluation is summarized in terms of different key parameters. These includes market trends and regulations, opportunities for improvement by special- purpose-design to attract customers,

identification of possibly oversized components and reduction of oversizing, and identification of areas where further research is needed.

VI. CONCLUSION

The issues associated with electric bike such as designed drives that are most efficient over a given operating period. The results of the studies listed here can serve as a platform to improve electric bike performance if new drive systems are designed around key parameters that will result in improvement of the system performance.

VII. FUTURE SCOPE

Areas of Further Research and Developments are

Battery

- Further investigation is needed to examine how improved battery technology could improve the performance of electric bicycles.
- Further investigation on the importance and influence of battery density and charging time on electric bicycles is needed.

Drive

- The motor should be designed to be most efficient over the operating cycle.
- Further investigation is needed on the assets and drawbacks of different motor types and controllers.

Regenerative Braking

- Regenerative braking will be more useful in hilly areas or when braking is used often, as in city rides. Future work needs to identify the percentage recoverable energy, the impact on efficiency, cost and the reduction of dependence on battery technology.

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