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# Universal EV Battery Charger

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**Abstract**: Much of the work is done by fuel vehicles, but fuel costs are higher than that. The natural impact of this fuel combustion in the form of air pollution. Therefore, the company has determined that electric vehicles are the best choice for fuel vehicles and pollution reduction. Electric car needs to be charged. Therefore, a charging station is formed. However, there are no charging stations available when compared to gas stations. Some charging stations are nearby and others are far away. Therefore, I decided to build a charging station. From a hardware failure point of view, the weakest link in such a system is as a result, the focus of this study is on detecting and locating flaws [1].The aim of this work is to show how to detect defects in an electromechanical conversion chain for traditional or autonomous electric vehicles. EVs are feasible to operate the information and data collected by several sensors to recover a sequence of data such as currents, voltages, and speeds, and so on. Using the characteristics extraction technique, create an architecture for a fault detection model. The long short term memory (LSTM) technique for fault detection is displayed in this regard. This method has been used to build an electric vehicle prototype and has shown to be more accurate than other methods [2].This article describes a fault detection technique based on machine learning (ML) that can help maintenance assistant in discovering defects in induction machine power connections. The system has been built to handle not only single phasing failures but also opposing wiring connections.

**Keywords**: Electric vehicle, Battery Management, Monitoring, Safety.

## I. INTRODUCTION

The number of fuel vehicles on the road today is growing by the day, and as the number of vehicles grows, so does pollution. As a result of the market research, it has been determined that electric vehicles are a viable alternative to gasoline automobiles. Vehicles are powered by batteries.]] However, battery electric vehicles require a charging station. As a result, charging stations have been created. A charging station is a device that aids in the charging of an electric vehicle's battery. The electric vehicle's usual range is 50-100 kilometres per charge.as a result, charging stations at strategic locations are required to meet the range capacity of electric vehicles. In recent years, plug-in electric vehicles (PEVs), which include all-electric cars, neighbourhood electric vehicles, and plug-in hybrids, have gained more attention than ever before as a possible answer for the future transportation system. Consumers and fleets need a developed infrastructure of charging stations to generally adopt the usage of plug-in electric vehicles, because drivers need economical, convenient, and compatible choices for charging the batteries inside the vehicle. As a result, there is an increasing demand for widely spread public charging stations, some of which offer faster charging at higher voltages and currents than are available from household sources.

## II. NEED OF EV CHARGING STATION

In present days, the pollution are increase day by day because of burning petrol or diesel and lots of other thing. Also the price of this fuels like petrol diesel are also increase. Causes of using much more fuels, we have not a to much fuels to use in future. As per survey the electric vehicles are better option related to the fuels bikes. Because of the using electric vehicles it may help to reduce pollution. Also the cost will be reduced. But battery electric vehicles need a charging .so that's why charging stations are formed. Charging station helps to charge the battery of electric vehicles. The average range of the electric vehicle is 50-100 km per charged.

Today, pollution is increasing day by day as a result of the burning of gasoline or diesel, among other things. The cost of these fuels, such as gasoline and diesel, is also rising. Because of the increased consumption of fuels, we will not have enough fuel to utilise in the future. According to a survey, electric automobiles are a better option than gas bikes. It is possible that the adoption of electric vehicles will help to minimise pollution. In addition, the price will be decreased. However, battery electric vehicles require a charging station. As a result, charging stations have been created. A charging station is a device that aids in the charging of an electric vehicle's battery. The electric vehicle's usual range is 50-100 kilometres per charge.

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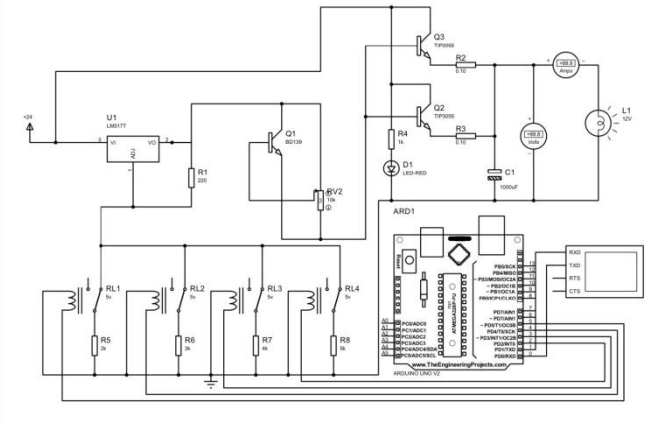
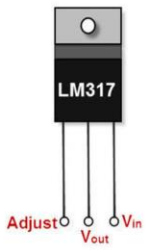
## **III.** SIMULATION DIAGRAM OF EV CHARGING STATION




## **IV.** COMPONENTS USED IN EV CHARGING STATION

1.LM-317




It is a sort of positive-linear-voltage regulator that was designed by Robert C. Dobkin and Robert J. Widlar in 1970 while working at National Semiconductor. The LM317 is a three-terminal positive voltage regulator with an output voltage range of 1.2 to 37 V and a maximum current of 1.5 A. The output voltage is set with only two external resistors, making this voltage regulator extremely simple to use. It is mostly used to regulate local and on-card transactions. The LM317 circuit can be utilised as a precision current regulator by connecting a fixed resistor between the output and adjustment of the LM317 regulator.

The LM317 regulator has a few unique properties, including the following:

It is conceptually regarded an operational amplifier with an output voltage range of 1.2V to 37V since it can provide an excess current of 1.5A. Internally, the LM317 voltage regulator circuit has thermal overload protection and continual short circuit current limiting. The 3-Lead Transistor Package and the surface mount D2PAK-3 are the two packages available. It is possible to do away with stocking a large number of fixed voltages.

**BD 139 TRANSISTOR**

Features

Plastic casing NPN Transistor

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Continuous Collector current (IC) is 1.5A
Base Current (Ib) is 0.5A
Emitter Base Breakdown Voltage (VBE) is 5V
BD139 Transistor Overview
Because the BD139 is an NPN transistor, when the base pin is held at ground, the collector and emitter will be open (reverse biassed), and when a signal is applied to the base pin, they will be closed (forward biassed).The gain value of BD139 ranges from 40 to 160, and this number defines the transistor's amplification capacity. Because the maximum amount of current that can flow through the Collector pin is 1.5A, we can't use this transistor to connect loads that need more than 1.5A. We must feed current to the base pin to bias a transistor; this current (IB) should be limited to 1/10th of the collector current, and the voltage across the base emitter pin should be no more than 5V .When fully biassed, this transistor can enable a maximum of 1.5A to flow between the collector and emitter. Saturation Region is the name for this stage, and the normal voltage allowed across the Collector-Emitter (V-CE) or Base-Emitter (VBE) is 80V. The transistor gets entirely off when the base current is eliminated; this stage is known as the Cut-off Region.
The BD139 was created by Phillips and is rated at 160MHz for specific audio applications. It was later cloned by other companies such as Samsung, ST, and others

**Where to use BD136 Transistor**

Being a Medium Power NPN Transistor with a collector current of 1.5A this transistor can be used to control (On/Off) bigger loads that consume less than 1.5A. It also has a very less saturation voltage (Base Emitter Voltage VBE) of only 5V, this makes it easy to use this IC in digital electronics which has an operating voltage of 5V.
Another peculiar fact about this transistor is that it comes in plastic package, while most medium power transistor are available only in metal can package. This reduces the cost of the Transistor and also since the package is not conductive it will not be affected by other noise in the circuit. Due to this feature this transistor is widely used in amplifier applications.
This transistor can be used to manage (On/Off) larger loads that use less than 1.5A because it is a Medium Power NPN Transistor with a collector current of 1.5A. It also has a low saturation voltage (Base Emitter Voltage VBE) of only 5V, making it suitable for use in digital circuits with a 5V working voltage.
Another odd feature of this transistor is that it is packaged in plastic, whereas most medium-power transistors are only accessible in metal cans. This lowers the cost of the transistor, and because the packaging is not conductive, it is unaffected by other circuit noise. This property makes this transistor popular in amplifier applications.
So, if you're looking for a medium-power NPN transistor in a plastic packaging, this transistor could be a good fit.
Within the working range of the TIP3055, the collector current IC is a function of the base current IB, with a change in the base current resulting in an amplified change in the collector current for a given collector emitter voltage VCE.

**TIP 3055 TRANSISTOR**


TIP3055 Features
Low saturation voltage
Simple drive requirements
High safe operating area
For low distortion complementary designs
Easy to carry and handle

## TIP3055 Pinouts

These are the main pinout TIP3055 which are well-defined beneath.

| Pin# | Type | Parameters |
|---|---|---|
| Pin#1 | Emitter | The emitter is for an external drive of current. |
| Pin#2 | Base | The base administers the biasing of the transistor. It vagaries the state of the transistor. |

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| | | |
|---|---|---|
| Pin#3 | Collector | The collector is for the current inside drive. It is related to the load. |

**ATmega328 Arduino Uno**

The Arduino Uno can be powered using either a USB connection or an external power supply. A battery or an AC to DC adapter are the most common external power supplies. The Arduino Uno can be connected to the adapter by inserting it into the Arduino board's power port. Similarly, the battery leads can be connected to the POWER connector's Vin and GND pins. The recommended voltage range is 7 volts to 1 volt.

Input & Output
With the help of routines like pinMode(), digitalWrite(), and Digital Read(), the Arduino Uno's 14 digital pins can be used as input and output ().
(Serial) Pins 1 (TX) and 0 (RX): The ATmega8U2 USB to TTL Serial chip equivalent pins are used to transmit and receive TTL serial data.

External Interrupts (Pins 2 and 3): External pins can be attached to initiate an interrupt when a low value or change in value occurs.
Pins 3, 5, 6, 9, 10, and 11 (PWM): This pin provides 8-bit PWM o/p via the analogWrite function ().

SPI Pins (Pin-10 (SS), Pin-11 (MOSI), Pin-12 (MISO), Pin-13 (SCK): These pins enable SPI communication, which is currently not supported by the Arduino language despite being available in the basic hardware.
Pin-13 (LED): This pin can be used to connect the built-in LED (digital pin). When the pin is LOW, the light emitting diode is enabled like the HIGH-value pin.

Pins 4 (SDA) and 5 (SCL) (I2C): It uses the Wire library to support TWI communication.
AREF (Alternative Reference Voltage): The analogue i/ps with analog Reference have a reference voltage ().
The reset (RST) pin is used to reset the microcontroller.

## Memory

The memory of this Atmega328 Arduino microcontroller includes flash memory-32 KB for storing code, SRAM-2 KB EEPROM-1 KB.

## Communication

UART TTL-serial communication is available on digital pins TX (1) and RX (1) on the Arduino Uno ATmega328 (0). An Arduino's software has a serial monitor that allows for quick data entry. When data is disseminated through the USB, two LEDs on the board, RX and TX, will blink.
The Arduino Uno is a type of ATmega328-based microcontroller board, and Uno is an Italian word that means "one." The name Arduino Uno was chosen to commemorate the imminent introduction of the Arduino Uno Board 1.0 microcontroller board.This board includes digital I/O pins-14, a power jack, analog i/ps-6, ceramic resonator-A16 MHz, a USB connection, an RST button, and an ICSP header. All these can support the microcontroller for further operation by connecting this board to the computer. The power supply of this board can be done with the help of an AC to DC adapter, a USB cable, otherwise a battery.The Arduino Uno power supply can be done with the help of a USB cable or an external power supply. The external power supplies mainly include AC to DC adapter otherwise a battery. Digital I/O pins-14, a power jack, analogue I/ps-6, ceramic resonator-A16 MHz, a USB connection, a RST button, and an ICSP header are all included on this board. By connecting this board to the computer, all of these can support the

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microcontroller for future functioning. An AC to DC adapter, a USB connection, or a battery can all be used to power this board.

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With the help of routines like pinMode(), digitalWrite(), and Digital Read(), the Arduino Uno's 14 digital pins can be used as input and output ().

Pins 1 (TX) and 0 (RX) (Serial) are used to send and receive TTL serial data, and are connected to the ATmega8U2 USB to TTL Serial chip corresponding pins.

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## V. ADVANTAGES OF EV CHARGING STATION

Help to maintain the battery health.

It safe and faster.

Multiple batteries can charge at a time.

## VI. CONCLUSION

Deep learning-based approaches are widely used in a variety of applications. However, five important In this work, electrical applications were studied for verification.Detailed analysis of DL technology for processing Electrical problems such as insulation failure detection, power line inspection, PV modules, bearing hotspot detection, etc.

This document describes troubleshooting and optimization of fuel efficiency in electric vehicles. DL has proven to be very useful In various industries. We have investigated and compared and analyzed the most important modern architecture. Attempts have been made to provide a current review of the literature on the five main concerns of. Electricity industry. It assists researchers who are interested in a particular area of the field [17]. This test can also be used for other electrical fault diagnosis. For rare applications of DL algorithms Recently implemented, including wastewater management, breast cancer prevention, and other non-electrical applications. As a result, the author wants to extend the previous sections of 1, 2, 3 and 1, 2, 3, and the following sections to this review in the future. Check out the more unusual applications of the DL algorithm. This is intended to give an overview of many possible applications. DL, helping researchers apply the DL algorithm in a broader context. DL progress was mainly made By examining many variations of the architecture already described in the literature. These variants

It has only been tested in the laboratory and there is no practical approach.

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