AMERICAN Journal of Engineering,
Mechanics and Architecture
Volume 01, Issue 06, 2023 ISSN (E): 2993-2637

Design and Fabrication of Electric Vehicles with Bluetooth Smart Battery Indication

Basheth Ahamed M
Department of Electrical and Electronics Engineering, Dhaanish Ahmed College of Engineering,
Chennai, Tamil Nadu, India.

Manoj Kumar K
Bachelor of Engineering,
Department of Electrical and Electronics Engineering, Dhaanish Ahmed College of Engineering,
Chennai, Tamil Nadu, India – 601301.

Sabiya Banu S
Bachelor of Engineering,
Department of Electrical and Electronics Engineering, Dhaanish Ahmed College of Engineering,
Chennai, Tamil Nadu, India.

Ashmi Christus A.T.
Assistant Professor,
Department of Electrical and Electronics Engineering, Dhaanish Ahmed College of Engineering,
Chennai, Tamil Nadu, India.

M. Gandhi
Assistant Professor,
Department of Electrical and Electronics Engineering, Dhaanish Ahmed College of Engineering,
Chennai, Tamil Nadu, India.

Abstract

The primary objective of this project is to provide a clear picture by connecting the dots between the numerous energy options available to humans. For humans to thrive in today's highly developed society, travel is a need. And to do that, he needs to make as few trips as possible. The electric bike described here is powered by a battery that sends electricity to the bike's engine. An Electric Bike, powered primarily by electricity, is the focus of this project's design and construction efforts. Since the bike is powered by electricity rather than gasoline, it can achieve better fuel economy, higher performance, and lower pollution levels than conventional vehicles. In an effort to lessen both noise and air pollution. It gives a more fuel-efficient and environmentally friendly car. As a result, the transmission is also utilised to regulate the acceleration and deceleration of the vehicle. Electricity, not gasoline, diesel, or any other fuel, has sparked a revolution in India's motorcycle market. The two-wheeler business in India has jumped on the bandwagon of the increasingly popular electric bike and scooter in the West and East. Therefore, the future of personal transportation is electric bikes and scooters. This research venture examines the design and development process and evaluates the performance of several subsystems. The project also details the functions of the various electric two-wheeler parts, including the battery, charger, hub motor, and controller.

Keywords- Travelling, Electric bike, Electric energy, Fuel economy, Pollution, eco-friendly, Controller, HC05 Bluetooth module, Voltage sensor.

INTRODUCTION

India has rapidly become one of the world's top ten automobile markets, and this trend is predicted to continue in light of the country's expanding middle class, which has purchasing power, and its robust economic growth. Apart from gasoline price deregulation, the topic of fuel pricing has received considerable attention in recent years [1]. Energy security has been a hot topic as of late, with alternative drive train technologies receiving a lot of attention because of the possibility of disruptions in Middle Eastern supply [2]. Improvements in battery technology, driving ranges, government incentives, regulations, cheaper prices, and better charging infrastructure are crucial to the success of EVs in India and other emerging countries [3]. Manufacturers who rely on internal combustion engines (ICEs) are showing a lot of enthusiasm for electric technology, and not simply as an add-on to their products [4]. Additionally, other EV-centric firms have cropped up around the globe. Although many theoretical aspects affecting the EV market are known, we surveyed consumers to learn more about their hopes and fears regarding the future of electric vehicles (EVs) and hybrid EVs [5-11]. It was difficult to predict interest in electric vehicles because doing so required surveying people about a product with which they were unfamiliar [12-19]. To this end, we investigated consumers' knowledge of electric vehicles (EVs), their thoughts on EVs in general (including price, brand, range, charging, infrastructure, and total cost of ownership), and their imagined fit of an EV into their lifestyle, taking into account a variety of demographic factors [20-24].

Motorcycles driven by electricity are similar to those powered by gasoline in that they both have engines that need to be fed in order to move forward. The most noticeable change is that electric motorcycles use batteries or fuel cells in place of gas. Electric motors work on a similar principle to internal combustion engines. Motorcycles use either gasoline or mechanical energy, but only one uses rechargeable batteries. In order for an electric vehicle to move, electricity is used to turn a pole in the vehicle's motor [25-29]. Instead of using fuel, the motor is driven by a rechargeable battery that can take you anywhere from 40 to 100 miles. When the switch is in the ON position, power passes from the battery to the motor, which in turn drives the rear wheels through a chain. Primary lithium batteries use lithium metal as the anode. Lithium-metal batteries are another name for these rechargeable power sources. Distinctive features that set these batteries apart from others are their high charge density (extended life) and high unit cost [30-37].

The positive and negative electrodes, as well as the electrolyte, are the three most important parts of a lead-acid battery. Standard lithium-ion cells typically have a carbon negative electrode. A metal oxide serves as the positive electrode, and a lithium salt dissolved in an organic solvent serves as the electrolyte. E-bikes are bicycles that are powered electrically and may be controlled by the rider. Sealed lead-acid (SLA), nickel-cadmium (NiCd), nickel-metal hydride (NiMH), and lithium-ion polymer (Li-ion) batteries are all examples of commonly used battery technologies

(Li-ion) [38-41]. Batteries can be distinguished from one another in a number of ways, including their voltage, total charge capacity (amp hours), weight, number of charging cycles before performance diminishes, and tolerance for over-voltage charging [42-47]. While the cost to operate an e-bike in terms of energy is low, the expense to replace the battery can be rather high. The amount of time a battery pack will last is relative to its intended use [48-55]. The lifespan of a battery can be prolonged by using it in shallow discharge/recharge cycles. Important aspects that affect an e-range bike's include the motor's efficiency, the battery's capacity, the effectiveness of the driving electronics, the bike's aerodynamics, the terrain, and the rider's weight. Regenerative braking is available on some models, such as the Canadian BionX and the American E+ (both made by Electric Motion Systems), which uses the engine as a generator to slow the bike down before the brake pads are engaged. The lifespan of brake pads and wheel rims can be lengthened with this. Fuel cell tests, like the PHB, are also being conducted. Supercapacitors have been tried out as a potential replacement for car batteries and in certain sport utility vehicles. For the Tour de Sol solar vehicle competition in the late 1980s, Switzerland created e-bikes equipped with solar charging stations, which were eventually installed on rooftops and wired into the city's power grid. In a modern twist, the bikes were charged directly from the wall outlet [56-64].

Since electric bikes don't produce any exhaust, we may safely call them "zero-emissions vehicles." However, (short-lived) high-storage-density battery production and disposal have environmental impacts that must be taken into account. Despite these drawbacks, e-bikes are widely regarded as environmentally preferable in metropolitan areas because of their supposedly decreased environmental impact when compared to traditional autos. E-bikes are excellent candidates for charging via solar power or other renewable energy resources because their battery packs are relatively tiny compared to those used in electric cars. Sanyo took advantage of this by installing "solar parking lots" where e-bikers may plug in and charge their bikes while they wait [65-71]. Some city governments, including Little Rock, Arkansas's Wave crest electric power-assisted bicycles and Cloverdale, California's Zap e-bikes, have adopted them because of the environmental benefits associated with e-bikes and electric/human-powered hybrids in general. The Chinese government is interested in increasing the export potential of Chinese-manufactured e-bikes, therefore companies like Xinri, a major Chinese e-bike producer, are forming partnerships with universities to upgrade their technology to meet international environmental standards [72-79]. A number of groups, including land management regulators and mountain bike trail access activists, have claimed that electric bicycles should not be allowed on outdoor trails open to mountain cyclists [80-85]. Low-powered pedal-assist electric mountain bikes may have similar physical repercussions to conventional mountain bikes, according to a study done by the International Mountain Bicycling Association.

Transmission with a hub the rotating stators receive electromagnetic fields from an external source. The motor's exterior casing either precisely tracks or closely approximates the path of the fields, causing the associated wheel to spin. Brushes in a brushed motor make contact with the shaft to transmit mechanical energy. A brushless motor transfers energy electronically rather than mechanically, thus no parts of the motor ever touch each other. Even while brushless motor technology is more expensive, it typically outperforms and outlasts its brushed counterpart [86-92]. A synchronous motor that operates on a direct current (DC) electric source is known as a brushless DC electric motor (BLDC motor or BL motor), electronically commutated motor (ECM or EC motor), or synchronous DC motor. The permanent magnet rotor orbits the field created by the DC currents being switched to the motor windings by an electronic controller. In order to regulate the DC motor's speed and torque, the controller manipulates the pulses' phase and amplitude. In place of the mechanical commutator(brushes) found in many standard electric motors is this electronic control system [93-101].

A brushless motor system can be either a Switched reluctance motor, an Induction (Asynchronous) motor, or a Permanent magnet synchronous motor (PMSM). Outrunners (where the rotor goes all the way around the stator) and axial flow motors (where the stator does) are two more common configurations (the rotor and stator are flat and parallel) [104-107]. When compared to brushed motors, brushless ones are more powerful and require less maintenance. They also run faster and can have their rotations per minute (rpm) and torque adjusted almost instantly. Brushless motors are used in a wide variety of electronic devices, from computer disc drives and printers to handheld power tools and even full-size cars [108-111]. Brushless DC motors have made it possible for direct-drive designs to replace the rubber belts and gears of traditional washing machines.

An electric motor's operation can be regulated by a motor controller, which consists of one or more components [112-117]. The motor can be started and stopped, rotated in either direction, sped up or slowed down, had its torque limited and protected against overloads and electrical mishaps with the help of a motor controller (fig.1).

Figure 1: Controller module

To more precisely regulate the motor's speed, start/stop, and rotation, a motor controller is preferred over a conventional mechanical switch [118-121]. A mechanical switch can only handle a certain amount of current. Most switches won't be able to handle the current that a large electric motor draws, which can be 30Amp or more. Furthermore, PWM cannot be used to regulate motor speed (PWM) [122-129]. H-bridge circuits are used in the majority of commercially available motor controllers because they allow us to operate a massive motor with a relatively weak signal (fig.2).

Figure 2: Controller module

In place of the traditional mechanical link between the accelerator pedal and the throttle, modern vehicles are equipped with electronic throttle control (ETC). Because of its goal of maintaining constant powertrain characteristics regardless of environmental factors including engine temperature, altitude, and accessory loads, electronic throttle control is rarely noticed by drivers [130-135]. Electronic throttle control works 'behind the scenes' to make shifting gears and managing the extreme torque surges that come with quick accelerations much simpler for the driver. Since the throttle may be controlled independently of the driver's accelerator pedal location, electronic throttle control enables the incorporation of features such as cruise control, traction control, stability control, and pre-crash systems that need torque management. Benefits of ETC include improved air-fuel ratio control, reduced exhaust emissions, and lower fuel consumption; it also complements technologies like gasoline direct injection. A throttle-operated electric bicycle moves ahead without the rider pedalling, similar to a motorcycle or scooter. Most have adjustable power output in response to throttle input. Unlike their pedal-assist equivalents, these are relatively rarer due to legal restrictions in many countries [136-141].

LEAD Acid Battery

Never play around with batteries or electrolytes; they are extremely dangerous. Put on some old clothes, goggles, and gloves. Battery acid is corrosive to cotton and wool and can cause severe burns and eye damage. Deeply discharging and then letting a lead-acid battery sit "dead" for a long time is the quickest method to destroy it. The battery's positive plates undergo a chemical reaction during the discharging process. When charged, they transform into lead oxide, and when discharged, they transform into lead sulphate. A portion of the plate will not convert back to lead oxide during a recharge if it has been in the lead sulphate state for several days. The longer the battery is left drained, the more positive the lead sulphate on the plate will become. Sulfate-affected plate regions are no longer effective energy storage media. If you repeatedly drain and partially charge your batteries, they may die in less than a year [142-147].

Internal Combustion Engine

An internal combustion engine is one in which the fuel is burned within the engine itself. There are other varieties, but most people use the term to refer to the device pioneered by Niklaus Otto. In this scenario, the pressure within a container is raised by fire (cylinder). A rod and wheel are moved by the pressure. The wheel is propelled and set in motion by the rod [148]. The belt or chain connects the spinning wheel to other wheels, such as four-car wheels. The engine is powerful enough to turn all four wheels. Without oil to prevent friction, an engine's moving parts would grind against one another and become stuck. Some components of an automobile engine have an extremely close tolerance of 0.01 millimetre and are measured as such. Combustion that takes place inside the engine, as opposed to exterior combustion like that of a steam engine, is what gives the former its name. Internal combustion engines, specifically four-stroke engines, power the vast majority of modern automobiles. Wankel engines are another variation on the internal combustion engine. Internal combustion gas turbines operate nonstop rather than in strokes. Internal combustion engines like those seen in rocket engines and firearms do not have wheels attached to them.

Mechanical Electric Motors

A mechanical understanding of electric motors is not required. Electric motors frequently attain 90 percent energy conversion efficiency over the full range of speeds and power output and may be accurately controlled. They can be used in tandem with regenerative braking systems, which harness kinetic energy from motion and store it as DC current. This can lessen the load on your vehicle's braking system, keeping your brake pads cleaner for longer. In the stop-and-go traffic of a metropolis, regenerative braking shines. Unlike internal combustion engines, they do not require many gears to meet power curves and may be precisely controlled even when stationary, providing tremendous torque. The use of torque converters and gearboxes is thus rendered superfluous. There is significantly less noise and vibration in electric vehicles compared to those powered by internal combustion engines. While this is an admirable quality, it has raised some safety concerns among the hearing-impaired, the elderly, and the young because they won't be able to hear an oncoming car [149]. Automakers and other businesses are working on solutions to this problem by creating systems that emit warning sounds whenever an electric vehicle moves too slowly, up to the speed at which the sounds of regular motion and rotation (the car's suspension, the electric motor, etc.) become audible.

Energy Efficiency

The tank-to-wheel efficiency of electric vehicles is roughly three times that of conventional gasoline-powered vehicles. Energy is not wasted while the car is parked, unlike internal combustion engines that use gasoline while idling. When considering the entire lifecycle of an electric vehicle, from the well to the wheel, the total emissions produced by these vehicles are actually quite close to those produced by efficient gasoline or diesel in most countries where electricity generation is based on the combustion of fossil fuels. It's important to remember that the way power is generated has a much larger impact on the well-to-wheel efficiency of an electric car than does the vehicle itself. If power generation shifted from using fossil fuels to using wind or tidal energy as its principal energy source, the efficiency of a certain type of electric car would immediately increase by a factor of two. To understand what is meant by the phrase "well-to-wheels," it is important to realise that the focus has shifted from the vehicle itself to the entire energy supply infrastructure, which, in the case of fossil fuels, includes the energy expended during exploration, mining, refining, and distribution. The demand for generation and transmission, as well as the resulting emissions, would rise if many private automobiles switched to grid electricity. However, due to the greater efficiency of electric vehicles over the full cycle, both energy consumption and emissions would decrease.

Battery-powered vehicles have the ability to reduce the spikes in electricity demand that occur during peak use hours (such the middle of the day when air conditioners are in high demand) by charging during the night, when there is idle generating capacity. As long as drivers don't mind having their batteries drained by the power company before they need to use their vehicle for an evening ride home, this vehicle-to-grid (V2G) connection can help lessen the demand for new power plants. The current electrical grid may also have to accommodate a rise in variable-output power sources like windmills and photovoltaic solar panels. The charging and discharging rates of EV batteries may be modified to account for this variation. Like modern gas stations, some theories envision battery swaps and charging facilities. These will need huge storage and charging potentials that can be adjusted to alter charging and output power during shortage periods, similar to how diesel generators are employed temporarily to support some national networks.

Heating of Electric Vehicles

Heating the car's interior and defrosting the windows requires a lot of power when driving in cold weather. This heat is present in internal combustion engines already, but it is redirected from the cooling system. The external costs of greenhouse gases are reduced by this method. If done with battery-electric vehicles, however, the interior heating may drain the batteries faster than usual. Although the motor(s) and battery pack could provide some heat, the better efficiency of these components means there is less waste heat available than there would be with a combustion engine. However, grid-connected battery electric vehicles can be preheated or cooled, reducing or eliminating the requirement for battery energy throughout the trip. The modern trend is to create vehicles with super-insulated interiors that can be warmed by the passengers' own body heat. However, in colder areas, the driver's 100 W of heating power is insufficient. The most realistic and viable solution to the EV's thermal management appears to be a reversible air conditioning system, which can cool the cabin in the summer and heat it in the winter. Ricardo Arboix proposed a novel idea in 2008 that uses a reversible AC system to manage both the temperature of the cabin and the temperature of the electric vehicle's battery. To do this, a third heat exchanger is added to the conventional heat pump/air conditioning system used in earlier Models like the GM EV1 and the Toyota RAV4 EV, and is thermally coupled to the battery core. The approach has been shown to bring about a number of advantages, such as extending the battery's life and enhancing the EV's performance and energy efficiency.

Motors and Drivetrains

Both brushed and brushless hub motors are widely utilised in e-bikes. Electric bicycles with motors use a wide variety of technology, ranging in price and complexity, including both direct-drive and geared motor units. Any bicycle with a chain drive, belt drive, hub motor, or friction drive can have an electric power-assist system installed. The stator of a BLDC hub motor is rigidly attached to the axle, and the magnets are attached to the wheel so that they rotate in unison with the wheel. The motor is the hub of the bicycle wheel. The motor's output is typically constrained to under 750 watts because to the available legal categories, though this is not always the case. The mid-drive system, another form of electric assist motor, is gaining in popularity. The electric motor in this system is not integrated into the wheel itself but rather is positioned close to (and typically under) the bicycle's bottom bracket shell. Most commonly, a belt or chain is run from the motor's cog or wheel to a pulley or sprocket attached to one of the crankset's arms. So, the pedals are where the power is applied before it reaches the wheel. The conventional drive train of the bicycle. In 1994, telecom supplier Ericsson developed it as a wireless replacement for RS-232 data lines. It can overcome synchronisation issues by linking multiple devices. The ability to send serial data is made possible through Bluetooth UART. Bluetooth-enabled gadgets allow for cordless telephony and point-to-point data transfers. It can easily replace a serial port, allowing the MCU and a personal computer to communicate with one another (fig.3).

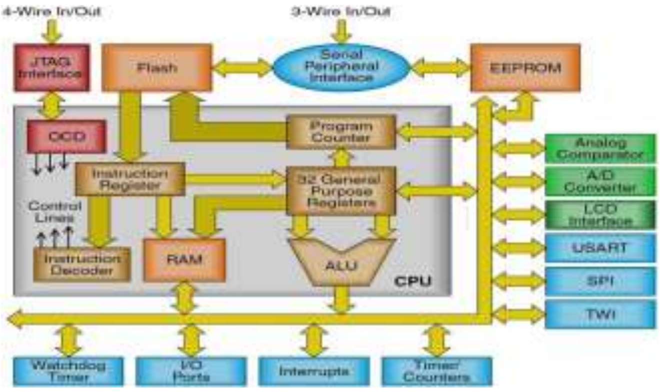

Figure 3: Architecture diagram [27]

An analog-to-digital converter (ADC, A/D, A-D, or A-to-D) is a system in electronics that transforms an analogue signal into a digital one, such as the sound picked up by a microphone or the light entering a digital camera. An analog-to-digital converter (ADC) is a piece of electronic equipment that takes an analogue voltage or current input and outputs a digital number that is proportional to the input voltage or current's magnitude. Since embedded systems work with digital values, yet their environments typically consist of a wide variety of analogue signals, A/D conversion is crucial to their operation. Before the microcontroller can process an analogue signal, it must be converted to digital. Using a PIC microcontroller, we can now see the digital o/p conversion of an external analogue signal shown on an LCD. The i/p signal's voltage can range from 0v to 5v.

In a quartz clock or watch, the battery powers an internal electrical circuit that in turn powers the quartz crystal. In other words, the quartz crystal vibrates back and forth at precisely 32768 cycles per second. If you apply a constant voltage to an oscillator, it will produce a steady ticking at a predetermined frequency. The crystal used in the oscillator serves as an excellent filter. The majority of microcontrollers just need a crystal for their oscillator because they already have everything else built in. The clock signals in microprocessors and microcontrollers are often generated by crystal oscillators. Let's have a look at the 8051 microcontroller, which (according to the model) is capable of running at 40 MHz but requires an external crystal oscillator circuit operating at 12 MHz (max). Using a 12 MHz clock, 8051 has an effective cycle rate of 1 MHz (3.33 MHz maximum) for every 12 clock cycles (considering a maximum 40MHz clock). All the internal processes are kept in time thanks to the clock pulses produced by this crystal oscillator. The military and aerospace industries use crystal oscillators to set up a reliable communication system for usage in areas like navigation, electronic warfare, guidance systems, and more. The crystal oscillator has numerous applications in fields as diverse as astronomy, medicine, space tracking, and metrology. Computers, digital systems, instrumentation, phase-locked loop systems, marine modems, sensors, telecommunications, disc drives, etc. are just some of the many industrial applications for crystal oscillators. The engine control unit, audio system, clock, radio, trip computer, and global positioning system all make use of the crystal oscillator. Crystal oscillators can be found in a wide variety of common household items like televisions, computers, cameras, video games, radios, cell phones, and more.

The fundamental benefit of this feature is that it enables electronic device makers to combine the programming and testing phases of production into a single, more efficient process, thus saving time and money. Instead of purchasing preprogrammed chips from a manufacturer or distributor, manufacturers may be able to programme the chips in their own system's production line, making it possible to introduce code or design changes during a production run. Due to their small size and inability to accommodate a bulky external programming cable, microcontrollers are typically attached directly to a printed circuit board. The usual supply voltage of the system is used to provide the programming voltage, and the chip then communicates with the programmer via a serial protocol. The JTAG protocol for ISPs is widely used in programmable logic devices to simplify their incorporation into automated testing environments. Most other gadgets adhere to either custom or antiquated standards when it comes to the protocols they use. A JTAG-controlled programming subsystem for non-JTAG devices like flash memory and microcontrollers can be implemented by designers in systems with a reasonably substantial amount of glue logic, bringing the entire programming and test procedure under the control of a single protocol.

Resistors

Electrical resistance is implemented in circuits with the help of resistors, which are passive two-terminal components. In electronic circuits, resistors are used to reduce current flow, adjust signal levels to voltage, bias active elements, and terminate transmission lines, among other uses. High-power resistors that can dissipate many watts of electrical power as heat may be used as part of motor controls, in power distribution systems, or as test loads for generated. The resistance of a fixed resistor rarely shifts in response to changes in environmental conditions like temperature or operating voltage. Besides functioning as a volume or light dimmer, variable resistors can be used as temperature, light, humidity, force, or chemical activity sensors. Resistors are widespread in electronic devices due to their common use in electrical networks and electronic circuits. Resistors used in practise can come in a wide variety of materials and shapes. Integrated circuits also make use of resistors. Common commercial resistors are produced over a range of more than nine orders of magnitude, with the resistance defining the electrical function of the component. The resistance's nominal value is within the component's stated manufacturing tolerance. It is described by Ohm's law. How a perfect resistor acts: According to Ohm's law, the resistance of a resistor serves as a constant in a proportional relationship between the voltage across it and the current flowing through it. Connecting the terminals of a 12-volt battery across a 300-ohm resistor results in a current of 12 / 300 = 0.04 amperes. Electrical resistance is measured in SI units using the Ohm () symbol, which honours Georg Simon Ohm. An ohm is equivalent to a volt per ampere. Since resistors are specified and manufactured over a very large range of values, the derived units of milliohm (1 mΩ = 10−3 Ω), kilohm (1 kΩ = 103 Ω), and megohm (1 MΩ = 106 Ω) are also in common usage.

This goal is based on a number of elements, most notably the effort to attract and convince the public to switch to these technologies, as the development and installation of each station entails corresponding financial expenditures. As the market for EVs grows, manufacturers will respond by lowering prices across the board to satisfy consumer demand. This includes the vehicles themselves, the battery, and charging infrastructure including infrastructure and installation. In addition, the development of quicker and more efficient charging techniques, such as the DC'superfast' charger, is occurring as electric charging station technology progresses; this may result in higher prices, though these are expected to decrease as demand rises. However, it has an extremely quick charging period (about 30 minutes), which may mean fewer charging stations will be required. Since we are using more and more nonrenewable resources like petroleum and diesel, we need to transition to renewable energy sources like solar panels, hydroelectric dams, and batteries, making electric vehicles the wave of the future. Other methods exist for reducing our energy consumption. The electric bike is one such method; it is a relatively recent mode of transportation that makes getting about simple for people of all ages. It's an inexpensive mode of transportation that may be used by anyone. This bike's motor is particularly efficient, and its battery pack combines light weight with rapid charging. These bicycles are easy on the environment, require little upkeep, and can be easily disassembled.

Conclusion

Fuels like gasoline and diesel are becoming increasingly scarce, thus it's important to find sustainable alternatives to traditional transportation methods like the electric bike. An electric bike is a bicycle with added electric and solar propulsion. More energy could be generated if solar panels were made available. Since it uses less power to operate, an electric bike is within everyone's price range. Anyone of any age can utilise it to travel shorter distances. It's possible to fake it at any time of year. Electric bikes are revolutionary because they eliminate the need for expensive and polluting fossil fuels. Clean, quiet, and environmentally responsible functioning is a close second. The best way to combat pollution is with the help of an electric bike. In a pinch, you can use an AC adaptor to power it up again. Solar panels can further reduce the already low operating cost per kilometre. It's easier to maintain because it has fewer moving parts and can be disassembled into smaller pieces. Providing a considerably more powerful motor for propulsion can boost the vehicle's speed while simultaneously extending the battery life. The addition of various tertiary electronic accessories allows for the creation of a more sophisticated and luxurious automobile. One method of charging that has the potential to become a growth industry is regenerative braking. Faster and more convenient vehicle use is possible thanks to the battery pack's ability to be compactly stacked and the stakes' interchangeability.

References

1. K. Bhardwaj, S. Rangineni, L. Thamma Reddi, M. Suryadevara, and K. Sivagnanam, "Pipeline-Generated Continuous Integration and Deployment Method For Agile Software Development," European Chemical Bulletin, vol. 12, no. Special Issue 7, pp. 5590–5603, 2023.
2. S. Rangineni, D. Marupaka, and A. K. Bhardwaj, "An examination of machine learning in the process of data integration," International Journal of Computer Trends and Technology, vol. 71, no. 6, pp. 79–85, Jun. 2023.
3. T. K. Behera, D. Marupaka, L. Thamma Reddi, and P. Gouda, "Enhancing Customer Support Efficiency through Seamless Issue Management Integration: Issue Sync Integration System," European Chemical Bulletin, vol. 12, no. 10, pp. 1157–1178.
4. S. Rangineni and D. Marupaka, "Analysis Of Data Engineering For Fraud Detection Using Machine Learning And Artificial Intelligence Technologies," International Research Journal of Modernization in Engineering Technology and Science, vol. 5, no. 7, pp. 2137–2146, Jul. 2023.
5. L. Thamma Reddi, "Transforming Management Accounting: Analyzing The Impacts Of Integrated Sap Implementation," International Research Journal of Modernization in Engineering

Technology and Science, vol. 5, no. 8, pp. 1786–1793, Aug. 2023.
6. M. Suryadevera, S. Rangineni, and S. Venkata, “Optimizing Efficiency and Performance: Investigating Data Pipelines for Artificial Intelligence Model Development and Practical Applications,” International Journal of Science and Research, vol. 12, no. 7, pp. 1330–1340, Jul. 2023.
7. D. Marupaka, S. Rangineni, and A. K. Bhardwaj, “Data Pipeline Engineering in The Insurance Industry: A Critical Analysis Of Etl Frameworks, Integration Strategies, And Scalability,” International Journal Of Creative Research Thoughts, vol. 11, no. 6, pp. c530–c539, Jun. 2023.
8. S. Rangineni, A. K. Bhardwaj, and D. Marupaka, “An Overview and Critical Analysis of Recent Advances in Challenges Faced in Building Data Engineering Pipelines for Streaming Media,” The Review of Contemporary Scientific and Academic Studies, vol. 3, no. 6, Jun. 2023.
9. N. Kaur and S. D. Tiwari, “Role of particle size distribution and magnetic anisotropy on magnetization of antiferromagnetic nanoparticles,” J. Phys. Chem. Solids, vol. 123, pp. 279–283, 2018.
10. N. Kaur and S. D. Tiwari, “Thermal decomposition of ferritin core,” Appl. Phys. A Mater. Sci. Process., vol. 125, no. 11, 2019.
11. N. Kaur and S. D. Tiwari, “Role of wide particle size distribution on magnetization,” Appl. Phys. A Mater. Sci. Process., vol. 126, no. 5, 2020.
12. N. Kaur and S. D. Tiwari, “Evidence for spin-glass freezing in NiO nanoparticles by critical dynamic scaling,” J. Supercond. Nov. Magn., vol. 34, no. 5, pp. 1545–1549, 2021.
13. Kaur and S. D. Tiwari, “Estimation of magnetic anisotropy constant of magnetic nanoparticles,” in DAE Solid State Physics Symposium 2019, 2020.
14. Bodepudi, M. Reddy, S. S. Gutlapalli, and M. Mandapuram, “Voice recognition systems in the Cloud Networks,” Asian Journal of Applied Science and Engineering, vol. 8, no. 1, pp. 51–60, 2019.
15. Bodepudi, M. Reddy, S. S. Gutlapalli, and M. Mandapuram, “Algorithm policy for the authentication of indirect fingerprints used in cloud computing,” American Journal of Trade and Policy, vol. 8, no. 3, pp. 231–238, 2021.
16. S. S. Gutlapalli, M. Mandapuram, M. Reddy, and A. Bodepudi, “Evaluation of Hospital Information Systems (his) in terms of their suitability for tasks,” Malaysian Journal of Medical and Biological Research, vol. 6, no. 2, pp. 143–150, 2019.
17. M. Mandapuram, “Applications of Blockchain and Distributed Ledger Technology (DLT) in Commercial Settings”, Asian Accounting and Auditing Advancement (4A Journal), vol. 7, no. 1, pp. 50–57, Dec. 2016.
18. M. Mandapuram, “Application of artificial intelligence in contemporary business: An analysis for content management system optimization,” Asian Business Review, vol. 7, no. 3, pp. 117–122, 2017a.
19. M. Mandapuram, “Security risk analysis of the internet of things,” ABC Research Alert, vol. 5, no. 3, pp. 49–55, 2017b.
20. M. Mandapuram, S. R. Thodupunori, A. Bodepudi, and M. Reddy, “Investigating the prospects of Generative Artificial Intelligence,” Asian Journal of Humanity, Art and Literature, vol. 5, no. 2, pp. 167–174, 2018.
21. M. Mandapuram, S. S. Gutlapalli, M. Reddy, and A. Bodepudi, “Application of artificial intelligence (AI) technologies to accelerate market segmentation,” Global Disclosure of Economics and Business, vol. 9, no. 2, pp. 141–150, 2020.

22. M. Mandapuram and Md. F. Hosen, "The object-oriented database management system versus the Relational Database Management System: A comparison," Global Disclosure of Economics and Business, vol. 7, no. 2, pp. 89–96, 2018.
23. M. Reddy, A. Bodepudi, M. Mandapuram, and S. S. Gutlapalli, "Face detection and recognition techniques through the Cloud Network: An Exploratory Study," ABC Journal of Advanced Research, vol. 9, no. 2, pp. 103–114, 2020.
24. G. P. Shukla, P. Chaudhary, P. Ghosh, M. Mandapuram, S. S. Gutlapalli, M Lourens, "Human resource management: a conceptual framework for comprehending the Internet of Things (IoT) and Machine Learning," Official Journal of the Patent Office (IN), no. 26/2023 (30/06/2023), 2023. Patent number 202321036845 A.
25. Nemade and D. Shah, "An IoT based efficient Air pollution prediction system using DLMNN classifier," Phys. Chem. Earth (2002), vol. 128, no. 103242, p. 103242, 2022.
26. Nemade and D. Shah, "An efficient IoT based prediction system for classification of water using novel adaptive incremental learning framework," J. King Saud Univ. - Comput. Inf. Sci., vol. 34, no. 8, pp. 5121–5131, 2022.
27. Pic-microcontroller.com. [Online]. Available: https://pic-microcontroller.com/how-to-choose-a-microcontroller-using-pic16c84-microcontroller/. [Accessed: 31-Aug-2023].
28. B. Nemade, "Automatic traffic surveillance using video tracking," Procedia Comput. Sci., vol. 79, pp. 402–409, 2016.
29. Rai, V., Gupta, G., Joshi, S., Kumar, R., & Dwivedi, A. (2023). LSTM-based adaptive whale optimization model for classification of fused multimodality medical image. Signal, Image and Video Processing, 1-10.
30. Joshi, S., & Dwivedi, A. (2020, March). RFID SYSTEM-used for monitoring and tracking patient (MTP). In 2020 International Conference on Computer Science, Engineering and Applications (ICCSEA) (pp. 1-10). IEEE.
31. Amrita, Joshi, S., Kumar, R., Dwivedi, A., Rai, V., & Chauhan, S. S. (2023). Water wave optimized nonsubsampled shearlet transformation technique for multimodal medical image fusion. Concurrency and Computation: Practice and Experience, 35(7), e7591.
32. Khatiwada, P., Joshi, S., Mohan, K. M., Chouhan, K., Gangodkar, D., & Khan, Z. Z. (2022, April). Design A Wireless Network Data Security System for Medical Records Using Cryptography. In 2022 2nd International Conference on Advance Computing and Innovative Technologies in Engineering (ICACITE) (pp. 207-211). IEEE.
33. Joshi, S., Rai, P. K., Kumar, R., & Dwivedi, A. (2022, May). Optical Text Translator from Images using Machine Learning. In 2022 International Conference on Computational Intelligence and Sustainable Engineering Solutions (CISES) (pp. 95-100). IEEE.
34. S. Joshi, P. K. Rai, R. Kumar, Rikendra and A. Dwivedi, "Optical Text Translator from Images using Machine Learning," 2022 International Conference on Computational Intelligence and Sustainable Engineering Solutions (CISES), Greater Noida, India, 2022, pp. 95-100.
35. R. Kumar, S. Joshi, V. Rai, A. Dwivedi and N. Jha, "Identification of Pneumonia in Corona Virus Patient," 2022 International Conference on Computational Intelligence and Sustainable Engineering Solutions (CISES), Greater Noida, India, 2022, pp. 419-423.
36. S. Joshi, R. Kumar, P. K. Rai and S. Garg, "Diabetic Retinopathy Using Deep Learning," 2023 International Conference on Computational Intelligence and Sustainable Engineering Solutions (CISES), Greater Noida, India, 2023, pp. 145-149.
37. R. Kumar, S. Joshi, C. Gupta and R. Aggarwal, "Recommender System for Mobile

Applications," 2023 International Conference on Artificial Intelligence and Smart Communication (AISC), Greater Noida, India, 2023, pp. 175-181.

38. S. Joshi, B. S, P. Rawat, D. Deshpande, M. K. Chakravarthi and D. Verma, "A Framework of Internet of Things (Iot) for the Manufacturing and Image Classification System," 2022 11th International Conference on System Modeling & Advancement in Research Trends (SMART), Moradabad, India, 2022, pp. 371-375.
39. R. Kunduru, "Security Concerns and Solutions for Enterprise Cloud Computing Applications," Asian Journal of Research in Computer Science, vol. 15, no. 4, pp. 24-33, 2023.
40. R. Kunduru, "Industry Best Practices on Implementing Oracle Cloud ERP Security," International Journal of Computer Trends and Technology, vol. 71, no. 6, pp. 1-8, 2023.
41. R. Kunduru, "Cloud Appian BPM (Business Process Management) Usage In health care Industry," IJARCCE International Journal of Advanced Research in Computer and Communication Engineering, vol. 12, no. 6, pp. 339-343, 2023.
42. R. Kunduru, "Effective Usage of Artificial Intelligence in Enterprise Resource Planning Applications," International Journal of Computer Trends and Technology, vol. 71, no. 4, pp. 73-80, 2023.
43. R. Kunduru, "Recommendations to Advance the Cloud Data Analytics and Chatbots by Using Machine Learning Technology," International Journal of Engineering and Scientific Research, vol. 11, no. 3, pp. 8-20, 2023.
44. R. Kunduru and R. Kandepu, "Data Archival Methodology in Enterprise Resource Planning Applications (Oracle ERP, Peoplesoft)," Journal of Advances in Mathematics and Computer Science, vol. 38, no. 9, pp. 115-127, 2023.
45. R. Kunduru, "Artificial Intelligence Usage in Cloud Application Performance Improvement," Central Asian Journal of Mathematical Theory and Computer Sciences, vol. 4, no. 8, pp. 42-47, 2023.
46. R. Kunduru, "Artificial Intelligence Advantages in Cloud Fintech Application Security," Central Asian Journal of Mathematical Theory and Computer Sciences, vol. 4, no. 8, pp. 48-53, 2023.
47. R. Kunduru, "Cloud BPM Application (Appian) Robotic Process Automation Capabilities," Asian Journal of Research in Computer Science, vol. 16, no. 3, pp. 267-280, Aug. 2023.
48. R. Kunduru, “Machine Learning in Drug Discovery: A Comprehensive Analysis of Applications, Challenges, and Future Directions”, IJOT, vol. 5, no. 8, pp. 29-37, Aug. 2023.
49. Alawneh,Y.(2022). Role of Kindergarten Curriculum in Instilling Ethical Values among Children in Governorates of Northern West Bank, Palestine, Dirasat: Educational Sciences,49(3),360-375
50. Al Khawaldeh,S., Alawneh,Y., Alzboun,M.(2022)., the availability of quality standards for the construction of science achievement tests from the point of view of the examination committees, Journal of Hunan University（Natural Sciences),49(9),1233-1247.
51. Alawneh,Y., Ashamali,M., Abdel-Hassan,R., Al-khawaldeh,S., Engestroom,y.(2022) Degree Of Use Of E-Learning Science Teachers In Public High Schools In During The Corona-Covid 19 Pandemic, Journal of Positive School Psychology,6(2), 1060-1070.
52. Alawneh,Y., Al-Shara'h,N. (2022) Evaluation of the e-learning experience in Palestinian universities during the Corona pandemic "in light of some quality standards of the Jordanian Higher Education, Journal of the College of Education (Assiut),38(2.2) 181-204
53. Alawneh,Y., Abualrub,D., Jbara,L.,(2021)Behavioral Phenomena Common Among Kindergarten Students In Nablus Governorate From The Point Of View Of Principals And

Teachers, Turkish Journal of Physiotherapy and Rehabilitation, 32, (3)231-247.
54. Upadhyay, S., Kumar, M., Kumar, A., Ghafoor, K. Z., & Manoharan, S. (2022). SmHeSol (IoT-BC): smart healthcare solution for future development using speech feature extraction integration approach with IoT and blockchain. Journal of Sensors, 2022.
55. Kumar, M., Mukherjee, P., Verma, S., Kavita, Shafi, J., Wozniak, M., & Ijaz, M. F. (2023). A smart privacy preserving framework for industrial IoT using hybrid meta-heuristic algorithm. Scientific Reports, 13(1), 5372.
56. Upadhyay, S., Kumar, M., Upadhyay, A., Verma, S., Kavita, Kaur, M., ... & Castillo, P. A. (2023). Challenges and Limitation Analysis of an IoT-Dependent System for Deployment in Smart Healthcare Using Communication Standards Features. Sensors, 23(11), 5155.
57. Kumar, A., Kumar, M., Verma, S., Jhanjhi, N. Z., & Ghoniem, R. M. (2022). Vbswp-CeaH: Vigorous Buyer-Seller Watermarking Protocol without Trusted Certificate Authority for Copyright Protection in Cloud Environment through Additive Homomorphism. Symmetry, 14(11), 2441.
58. Pratap, A., Kumar, A., & Kumar, M. (2021, May). Analyzing the need of edge computing for Internet of Things (IoT). In Proceedings of Second International Conference on Computing, Communications, and Cyber-Security: IC4S 2020 (pp. 203-212). Singapore: Springer Singapore.
59. Kumar, A., Kumar, M., Mahapatra, R. P., Bhattacharya, P., Le, T. T. H., Verma, S., & Mohiuddin, K. (2023). Flamingo-Optimization-Based Deep Convolutional Neural Network for IoT-Based Arrhythmia Classification. Sensors, 23(9), 4353.
60. Kumar, M., Mukherjee, P., Verma, S., Kaur, M., Singh, S., Kobielnik, M., ... & Ijaz, M. F. (2022). BBNSF: Blockchain-Based Novel Secure Framework Using RP2-RSA and ASR-ANN Technique for IoT Enabled Healthcare Systems. Sensors, 22(23), 9448.
61. Kumar, M., Kumar, A., Verma, S., Bhattacharya, P., Ghimire, D., Kim, S. H., & Hosen, A. S. (2023). Healthcare Internet of Things (H-IoT): Current Trends, Future Prospects, Applications, Challenges, and Security Issues. Electronics, 12(9), 2050.
62. Kumar, M., Kumar, D., & Akhtar, M. A. K. (2021). A modified GA-based load balanced clustering algorithm for WSN: MGALBC. International Journal of Embedded and Real-Time Communication Systems (IJERTCS), 12(1), 44-63
63. Kumar, M., Kumar, D., & Akhtar, M. A. K. (2018, October). Mathematical model for sink mobility (MMSM) in wireless sensor networks to improve network lifetime. In Communication, Networks and Computing: First International Conference, CNC 2018, Gwalior, India, March 22-24, 2018, Revised Selected Papers (pp. 133-141). Singapore: Springer Singapore
64. K. Gaurav, A. S. Ray, and A. Pradhan, “Investment Behavior of Corporate Professionals Towards Mutual Funds in India,” International Journal of Accounting & Finance Review, vol. 14, no. 1, pp. 30–39, 2023.
65. M. Rajanikanth and K. Gaurav, “Influence of Reference Group on Tractor Purchasing Decision of Farmers In Telangana,” Academy of Marketing Studies Journal, vol. 27, no. 5, pp. 1–12, 2023.
66. K. Gaurav, A. S. Ray, and N. K. Sahu, “Factors Determining the Role of Brand in Purchase Decision of Sportswear,” PalArch’s Journal of Archaeology of Egypt / Egyptology, vol. 17, no. 7, pp. 2168–2186, 2020.
67. K. Gaurav and V. Raju, “Factors influencing Highway Retailer Satisfaction in FMCG industry,” Mukt Shabd Journal, vol. 9, no. 4, pp. 1297–1316, 2020.
68. K. Gaurav and A. Suraj Ray, “Impact of Social Media Advertising on Consumer Buying Behavior in Indian E-commerce Industry,” Sumedha Journal of Management, vol. 9, no. 1, pp.

41–51, Jun. 2020.

69. Khan, S. (2021). Data Visualization to Explore the Countries Dataset for Pattern Creation. International Journal of Online Biomedical Engineering, 17(13), 4-19.
70. Khan, S. (2021). Visual Data Analysis and Simulation Prediction for COVID-19 in Saudi Arabia Using SEIR Prediction Model. International Journal of Online Biomedical Engineering, 17(8).
71. Khan, S. (2022). Business Intelligence Aspect for Emotions and Sentiments Analysis. Paper presented at the 2022 First International Conference on Electrical, Electronics, Information and Communication Technologies (ICEEICT).
72. Khan, S. (2021). Study Factors for Student Performance Applying Data Mining Regression Model Approach. International Journal of Computer Science Network Security, 21(2), 188-192.
73. Khan, S., & Alshara, M. (2019). Development of Arabic evaluations in information retrieval. International Journal of Advanced Applied Sciences, 6(12), 92-98.
74. Fazil, M., Khan, S., Albahlal, B. M., Alotaibi, R. M., Siddiqui, T., & Shah, M. A. (2023). Attentional Multi-Channel Convolution With Bidirectional LSTM Cell Toward Hate Speech Prediction. IEEE Access, 11, 16801-16811.
75. Khan, S., Siddiqui, T., Mourade, A. et al. Manufacturing industry based on dynamic soft sensors in integrated with feature representation and classification using fuzzy logic and deep learning architecture. Int J Adv Manuf Technol (2023).
76. Khan, S., & AlSuwaidan, L. (2022). Agricultural monitoring system in video surveillance object detection using feature extraction and classification by deep learning techniques. Computers and Electrical Engineering, 102, 108201.
77. S. Khan, V. Ch, K. Sekaran, K. Joshi, C. K. Roy and M. Tiwari, "Incorporating Deep Learning Methodologies into the Creation of Healthcare Systems," 2023 International Conference on Artificial Intelligence and Smart Communication (AISC), Greater Noida, India, 2023, pp. 994-998.
78. Gupta, G., Khan, S., Guleria, V., Almjally, A., Alabduallah, B. I., Siddiqui, T., Albahlal, B. M., et al. (2023). DDPM: A Dengue Disease Prediction and Diagnosis Model Using Sentiment Analysis and Machine Learning Algorithms. Diagnostics, 13(6), 1093.
79. Tadiboina, S. N., & Chase, G. C. (2022). The importance and leverage of modern information technology infrastructure in the healthcare industry. Int J Res Trends Innov, 7(11), 340-344.
80. Chaudhary, J. K., Sharma, H., Tadiboina, S. N., Singh, R., Khan, M. S., & Garg, A. (2023). Applications of Machine Learning in Viral Disease Diagnosis. In 2023 10th International Conference on Computing for Sustainable Global Development (INDIACom) (pp. 1167-1172). IEEE.
81. Jain, A., Krishna, M. M., Tadiboina, S. N., Joshi, K., Chanti, Y., & Krishna, K. S. (2023). An analysis of medical images using deep learning. In 2023 3rd International Conference on Advance Computing and Innovative Technologies in Engineering (ICACITE) (pp. 1440-1445). IEEE.
82. Manikandan, N., Tadiboina, S. N., Khan, M. S., Singh, R., & Gupta, K. K. (2023). Automation of Smart Home for the Wellbeing of Elders Using Empirical Big Data Analysis. In 2023 3rd International Conference on Advance Computing and Innovative Technologies in Engineering (ICACITE) (pp. 1164-1168). IEEE.
83. Mahendran, R., Tadiboina, S. N., Thrinath, B. S., Gadgil, A., Madem, S., & Srivastava, Y. (2022). Application of Machine Learning and Internet of Things for Identification of Nutrient Deficiencies in Oil Palm. In 2022 5th International Conference on Contemporary Computing and

Informatics (IC3I) (pp. 2024-2028). IEEE.
84. L. Mohanty, S. K. Panigrahi, and M. Patnaik, "Assessment of water quality of Mahanadi basin using statistical and wavelet techniques," Materials Today: Proceedings, vol. 62, pp. 6371–6378, 2022.
85. J. Pradhan, S. Panda, R. K. Mandal, and S. K. Panigrahi, "Influence of GGBFS-based blended precursor on fresh properties of self-compacting geopolymer concrete under ambient temperature," Materials Today: Proceedings, p. S221478532303732X, Jul. 2023.
86. R. Das, S. Panda, A. S. Sahoo, and S. K. Panigrahi, "Effect of superplasticizer types and dosage on the flow characteristics of GGBFS based self-compacting geopolymer concrete," Materials Today: Proceedings, p. S2214785323037331, Jul. 2023.
87. S. K. Parhi and S. K. Panigrahi, "Alkali–silica reaction expansion prediction in concrete using hybrid metaheuristic optimized machine learning algorithms," Asian Journal of Civil Engineering, pp. 1–23, 2023.
88. S. K. Parhi, S. Dwibedy, S. Panda, and S. K. Panigrahi, "A comprehensive study on Controlled Low Strength Material," Journal of Building Engineering, p. 107086, 2023.
89. S. K. Panigrahi and A. K. Sahoo, "Possible use of T-section columns in RC frame," Indian concrete journal, vol. 77, no. 12, pp. 1518–1522, 2003.
90. S. K. Panigrahi, A. Deb, and S. K. Bhattacharyya, "Effect of laminate stiffness on failure mode in FRP wrapped T beams," IJRET, vol. 4, no. 13, pp. 510–520, 2015.
91. S. S. Banait, S. S. Sane, D. D. Bage and A. R. Ugale, "Reinforcement mSVM: An Efficient Clustering and Classification Approach using reinforcement and supervised Technique, "International Journal of Intelligent Systems and Applications in Engineering (IJISAE), Vol.35, no.1S, p .78-89. 2022.
92. S. S. Banait, S. S. Sane and S. A. Talekar, "An efficient Clustering Technique for Big Data Mining" , International Journal of Next Generation Computing (IJNGC) , Vol.13, no.3, pp.702-717. 2022.
93. S. A. Talekar , S. S. Banait and M. Patil.. "Improved Q- Reinforcement Learning Based Optimal Channel Selection in CognitiveRadio Networks," International Journal of Computer Networks & Communications (IJCNC), Vol.15, no.3, pp.1-14, 2023.
94. S. S. Banait and Dr. S. S. Sane, "Novel Data Dimensionality Reduction Approach Using Static Threshold, Minimum Projection Error and Minimum Redundancy, " Asian Journal of Organic & Medicinal Chemistry (AJOMC) , Vol.17, no.2, pp.696-705, 2022.
95. S. S. Banait and S. S. Sane, "Result Analysis for Instance and Feature Selection in Big Data Environment, "International Journal for Research in Engineering Application & Management, Vol.8, no.2, pp.210-215, 2022.
96. G. K. Bhamre and S. S. Banait, "Parallelization of Multipattern Matching on GPU, "International Journal of Electronics, Communication & Soft Computing Science and Engineering, Vol.3, no.3, pp.24-28, 2014.
97. K. Gupta, A. Choubey, and S. Choubey, "Salp swarm optimisation with deep transfer learning enabled retinal fundus image classification model," Int. J. Netw. Virtual Organ., vol. 27, no. 2, p. 163–180, 2022.
98. Gupta, I.K., Choubey, A. and Choubey, S., 2022. Mayfly optimization with deep learning enabled retinal fundus image classification model. Computers and Electrical Engineering, 102, p.108176.
99. Gupta, I.K., Choubey, A. and Choubey, S., 2022. Artifical intelligence with optimal deep

learning enabled automated retinal fundus image classification model. Expert Systems, 39(10), p.e13028.
100. Mishra, A.K., Gupta, I.K., Diwan, T.D. and Srivastava, S., 2023. Cervical precancerous lesion classification using quantum invasive weed optimization with deep learning on biomedical pap smear images. Expert Systems, p.e13308.
101. Gupta, I.K., Mishra, A.K., Diwan, T.D. and Srivastava, S., 2023. Unequal clustering scheme for hotspot mitigation in IoT-enabled wireless sensor networks based on fire hawk optimization. Computers and Electrical Engineering, 107, p.108615.
102. Mishra, S., & Samal, S. K. (2023). An Efficient Model for Mitigating Power Transmission Congestion Using Novel Rescheduling Approach. Journal of Circuits, Systems and Computers, 2350237.
103. Samal, S. K., & Khadanga, R. K. (2023). A Novel Subspace Decomposition with Rotational Invariance Technique to Estimate Low-Frequency Oscillatory Modes of the Power Grid. Journal of Electrical and Computer Engineering, 2023.
104. Mishra, S., & Kumar Samal, S. (2023). Mitigation of transmission line jamming by price intrusion technique in competitive electricity market. International Journal of Ambient Energy, 44(1), 171-176.
105. Subudhi, S. K. Sarnal and S. Ghosh, "A new low-frequency oscillatory modes estimation using TLS-ESPRIT and least mean squares sign-data (LMSSD) adaptive filtering," TENCON 2017 - 2017 IEEE Region 10 Conference, Penang, Malaysia, 2017, pp. 751-756.
106. P. K. Sahu, S. Maity, R. K. Mahakhuda and S. K. Samal, "A fixed switching frequency sliding mode control for single-phase voltage source inverter," 2014 International Conference on Circuits, Power and Computing Technologies [ICCPCT-2014], Nagercoil, India, 2014, pp. 1006-1010.
107. Mishra, S., & Samal, S. K. (2023). Impact of electrical power congestion and diverse transmission congestion issues in the electricity sector. Energy Systems, 1-13.
108. Sahoo, A. K., & Samal, S. K. (2023). Online fault detection and classification of 3-phase long transmission line using machine learning model. Multiscale and Multidisciplinary Modeling, Experiments and Design, 6(1), 135-146.
109. Maseleno, S. Patimah, S. Syafril, M. Huda, "Learning Preferences Diagnostic using Mathematical Theory of Evidence," FMDB Transactions on Sustainable Techno Learning., vol. 1, no. 2, pp. 60 –77, 2023.
110. Patel, S. Samal, S. Ghosh and B. Subudhi, "A study on wide-area controller design for inter-area oscillation damping," 2016 2nd International Conference on Control, Instrumentation, Energy & Communication (CIEC), Kolkata, India, 2016, pp. 245-249.
111. Ali Y., Shreemali J., Chakrabarti T., Chakrabarti P. , Poddar S., "Prediction of Reaction Parameters on Reaction Kinetics for Treatment of Industrial Wastewater: A Machine Learning Perspective", Materials Today :Proceedings,2020.
112. Ashish Kumar Sinha, Ananda Shankar Hati , Mohamed Benbouzid , Prasun Chakrabarti , "ANN-based Pattern Recognition for Induction Motor Broken Rotor Bar Monitoring under Supply Frequency Regulation", Machines , 9(5):87, 2021.
113. Chakrabarti P. , Basu J.K. , Kim T.H., "Business Planning in the light of Neuro-fuzzy and Predictive Forecasting", Communications in Computer and Information Science , 123, pp.283-290, 2010.
114. Chakrabarti P. , Goswami P.S., "Approach towards realizing resource mining and secured

information transfer", International Journal of Computer Science and Network Security, 8(7), pp.345-350, 2008.

115. Chakrabarti P. ,Chakrabarti T., Sharma M . , Atre D, Pai K.B., "Quantification of Thought Analysis of Alcohol-addicted persons and memory loss of patients suffering from stage-4 liver cancer", Advances in Intelligent Systems and Computing, 1053, pp.1099-1105, 2020.

116. Chakrabarti P., Bane S.,Satpathy B.,Goh M, Datta B N , Chakrabarti T., "Compound Poisson Process and its Applications in Business", Lecture Notes in Electrical Engineering, 601, pp.678-685,2020.

117. Chakrabarti P., Bhuyan B., Chaudhuri A. and Bhunia C.T., "A novel approach towards realizing optimum data transfer and Automatic Variable Key(AVK)" , International Journal of Computer Science and Network Security, 8(5), pp.241-250, 2008.

118. Chakrabarti P., Chakrabarti T., Satpathy B., SenGupta I . Ware J A., "Analysis of strategic market management in the light of stochastic processes, recurrence relation, Abelian group and expectation", Advances in Artificial Intelligence and Data Engineering, 1133 , pp.701-710, 2020.

119. Chakrabarti P., Choudhury A., Naik N. , Bhunia C.T., "Key generation in the light of mining and fuzzy rule", International Journal of Computer Science and Network Security, 8(9), pp.332-337, 2008.

120. Chakrabarti P., De S.K., Sikdar S.C., "Statistical Quantification of Gain Analysis in Strategic Management" , International Journal of Computer Science and Network Security,9(11), pp.315-318, 2009.

121. Chakrabarti P., Satpathy B., Bane S., Chakrabarti T., Poddar S., "Business gain forecasting in Materials Industry - A linear dependency, exponential growth, moving average, neuro-associator and compound Poisson process perspective", Materials Today: Proceedings, 2020.

122. Chakrabarti P., Satpathy B., Bane S., Chakrabarti T., Chaudhuri N.S. , Siano P., "Business forecasting in the light of statistical approaches and machine learning classifiers", Communications in Computer and Information Science , 1045, pp.13-21, 2019.

123. K. Sharma, B. Singh, E. Herman, R. Regine, S. S. Rajest and V. P. Mishra, "Maximum Information Measure Policies in Reinforcement Learning with Deep Energy-Based Model," 2021 International Conference on Computational Intelligence and Knowledge Economy (ICCIKE), 2021, pp. 19-24.

124. K. Sharma, B. Singh, M. Raja, R. Regin and S. S. Rajest, "An Efficient Python Approach for Simulation of Poisson Distribution," 2021 7th International Conference on Advanced Computing and Communication Systems (ICACCS), 2021, pp. 2011-2014.

125. K. Sharma, B. Singh, R. Regin, R. Steffi and M. K. Chakravarthi, "Efficient Classification for Neural Machines Interpretations based on Mathematical models," 2021 7th International Conference on Advanced Computing and Communication Systems (ICACCS), 2021, pp. 2015-2020.

126. K. Sharma, N. A. Jalil, R. Regin, S. S. Rajest, R. K. Tummala and T. N, "Predicting Network Congestion with Machine Learning," 2021 2nd International Conference on Smart Electronics and Communication (ICOSEC), 2021, pp. 1574-1579.

127. Saxena and S. Chaudhary, "Predicting Brain Diseases from FMRI-Functional Magnetic Resonance Imaging with Machine Learning Techniques for Early Diagnosis and Treatment," FMDB Transactions on Sustainable Computer Letters., vol. 1, no. 1, pp. 33–48, 2023.

128. Arslan, B. Singh, D. K. Sharma, R. Regin, R. Steffi and S. Suman Rajest, "Optimization Technique Approach to Resolve Food Sustainability Problems," 2021 International Conference

on Computational Intelligence and Knowledge Economy (ICCIKE), 2021, pp. 25-30.
129. Ogunmola, B. Singh, D. K. Sharma, R. Regin, S. S. Rajest and N. Singh, "Involvement of Distance Measure in Assessing and Resolving Efficiency Environmental Obstacles," 2021 International Conference on Computational Intelligence and Knowledge Economy (ICCIKE), 2021, pp. 13-18.
130. J. A. Jeba, S. R. Bose, R. Boina, "Exploring Hybrid Multi-View Multimodal for Natural Language Emotion Recognition Using Multi-Source Information Learning Model," FMDB Transactions on Sustainable Computer Letters., vol. 1, no. 1, pp. 12–24, 2023.
131. Kothi N., Laxkar P. Jain A. , Chakrabarti P., "Ledger based sorting algorithm", Advances in Intelligent Systems and Computing, 989, pp. 37-46, 2020.
132. Magare A., Lamin M., Chakrabarti P., "Inherent Mapping Analysis of Agile Development Methodology through Design Thinking", Lecture Notes on Data Engineering and Communications Engineering, 52, pp.527-534,2020.
133. P.P. Anand, U. K. Kanike, P. Paramasivan, S. S. Rajest, R. Regin, S. S. Priscila, "Embracing Industry 5.0: Pioneering Next-Generation Technology for a Flourishing Human Experience and Societal Advancement," FMDB Transactions on Sustainable Social Sciences Letters, vol. 1, no. 1, pp. 43–55, 2023.
134. P.S. Venkateswaran, S. Singh, P. Paramasivan, S. S. Rajest, M. E. Lourens, R. Regin, "A Study on The Influence of Quality of Service on Customer Satisfaction Towards Hotel Industry," FMDB Transactions on Sustainable Social Sciences Letters, vol. 1, no. 1, pp. 1–11, 2023.
135. Patidar H. , Chakrabarti P., "A Novel Edge Cover based Graph Coloring Algorithm", International Journal of Advanced Computer Science and Applications , 8(5),pp.279-286,2017.
136. Patidar H. , Chakrabarti P., "A Tree-based Graphs Coloring Algorithm Using Independent Set", Advances in Intelligent Systems and Computing, 714, pp. 537-546, 2019.
137. Patidar H., Chakrabarti P., Ghosh A., "Parallel Computing Aspects in Improved Edge Cover based Graph Coloring Algorithm", Indian Journal of Science and Technology ,10(25),pp.1-9,2017.
138. Prasad A. , Chakrabarti P., "Extending Access Management to maintain audit logs in cloud computing", International Journal of Advanced Computer Science and Applications ,5(3),pp.144-147, 2014.
139. Prince, Ananda Shankar Hati , Prasun Chakrabarti , Jemal Hussein , Ng Wee Keong , "Development of Energy Efficient Drive for Ventilation System using Recurrent Neural Network" , Neural Computing and Applications , 33 : 8659 , 2021.
140. Priyadarshi N., Bhoi A.K., Sahana S.K., Mallick P.K. , Chakrabarti P., Performance enhancement using novel soft computing AFLC approach for PV power system", Advances in Intelligent Systems and Computing, 1040, pp.439-448,2020.
141. Priyadarshi N., Bhoi A.K., Sharma A.K., Mallick P.K. , Chakrabarti P., "An efficient fuzzy logic control-based soft computing technique for grid-tied photovoltaic system", Advances in Intelligent Systems and Computing, 1040,pp.131-140,2020.
142. S. Alayli, "Unravelling the Drivers of Online Purchasing Intention: The E-Commerce Scenario in Lebanon," FMDB Transactions on Sustainable Social Sciences Letters, vol. 1, no. 1, pp. 56–67, 2023.
143. S. Cirillo, G. Polese, D. Salerno, B. Simone, G. Solimando, "Towards Flexible Voice Assistants: Evaluating Privacy and Security Needs in IoT-enabled Smart Homes," FMDB Transactions on Sustainable Computer Letters., vol. 1, no. 1, pp. 25–32, 2023.

144. Shah K., Laxkar P. , Chakrabarti P., “A hypothesis on ideal Artificial Intelligence and associated wrong implications”, Advances in Intelligent Systems and Computing, 989, pp.283-294, 2020.
145. Sharma A.K., Panwar A., Chakrabarti P. ,Viswakarma S., “Categorization of ICMR Using Feature Extraction Strategy and MIR with Ensemble Learning”, Procedia Computer Science, 57,pp.686-694,2015.
146. Tiwari M., Chakrabarti P , Chakrabarti T., “Performance analysis and error evaluation towards the liver cancer diagnosis using lazy classifiers for ILPD”, Communications in Computer and Information Science , 837, pp.161-168,2018.
147. Tiwari M., Chakrabarti P, Chakrabarti T., “Novel work of diagnosis in liver cancer using Tree classifier on liver cancer dataset (BUPA liver disorder)” , Communications in Computer and Information Science , 837, pp.155-160, 2018.
148. Verma K., Srivastava P. , Chakrabarti P., “Exploring structure oriented feature tag weighting algorithm for web documents identification”, Communications in Computer and Information Science ,837, pp.169-180, 2018.
149. Y. M. Sabti, R. I. N. Alqatrani, M. I. Zaid, B. Taengkliang, J. M. Kareem, “Impact of Business Environment on the Performance of Employees in the Public-Listed Companies,” FMDB Transactions on Sustainable Management Letters., vol. 1, no. 2, pp. 56-65, 2023.