

LIST FOR MECHANICAL PROJECTS

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MATERIAL HANDLING

MOTORISED OBJECT LIFTING JACK : The object lifting Jack works with the help of geared motors and worm gear arrangement to lift the objects. The modified version can even lift car using the same principle.

KEY CONTROLLED- FORK LIFTER: - This Fork lifter lift the floor items and place at the required space as instructed by Key controls.

MATERIAL HANDLING (X, Y, Z MOTION CONTROL): - A switch controlled material handling mechanical assembly that can pick or place the goods in all three axis using three gear motors.

STEPPER MOTOR CONTROL WITH SELECTED STEPS FOR CONVEYOR BELT: -An automatic system that moves the stepper motor for bottle vending /material dispenser control system.

OBJECT REJECTION & COUNTING MACHINE: - A conveyor belt based project that carries goods of different height or material. The object rejection setup removes the item from the moving belt if it does not fulfill the condition.

ROBOTIC ARM WITH GRIPPER: - A three-gear motor setup of robotic arm is an interesting project under material handling. Six keys operation controls the whole setup of the model.

NEUMATIC/HYDRAULIC ROBO ARM: The air pressure is the base behind this to move the arm to grip, to lift and to rotate the material to handle. A mini compressor will create the air pressure.

NEUMATIC/HYDRAULIC CRANE: The air pressure is the base behind this to move the arm to pick and to lift the material handling crane. A mini compressor will create the air pressure.

NEUMATIC/HYDRAULIC JACK: The air pressure will lift the material using a single piston. The up/down valves will control the whole operation. A mini compressor will create the air pressure.

ROBOTIC CRANE : A dual motor crane to lift material from ground level and place the material at the other side of it by a moving arm using other motor. One can put the whole crane on a robotic vehicle with another two motors as moving crane for material handling.

ROBOTIC TROLLEY FOR MATERIAL HANDLING: This trolley can be implanted on rough surface to carry material and drop at a specific area.

AUTOMATIC STAMPING AND SORTING MACHINE FOR POST CARD: This machine with a conveyor belt will check the four major cities and sort the post cards in their corresponding boxes with auto stamped on it.

ALTERNATE ENERGY GENERATION

WIND MILL: The Actual wind mill model that produce electrical energy from wind and charge the battery to run inverter directly.

SOLAR SUN SEEKER: - It actually track the sun as per its position and move the solar cell/water heating plates accordingly so as to get maximum power from sun light.

THERMAL POWER PLANT USING STEAM: Steam energy is alternatively used to generate electrical energy. A traditional arrangement commonly used by any thermal plant but still very useful to display as teaching aid.

HYDEL POWER DAM: A Device SETUP that generate electrical energy from running water. The model comprises a pump, a water reservoir, an alternator to gen. electrical energy.

ELECTRICAL ENERGY FROM AMUSEMENT PARK RIDES (SEA-SAW, SWING, SLIDE, ROLLER ETC.) : The different amusement rides can be designed to generate electrical energy while children are using actually the park.

ELECTRICAL ENERGY FROM SPEED BREAKER: This can be designed to generate electrical energy when vehicles cross the breaker and roll the roller based speed breakers connected with an alternator.

PADDLE CONTROLLED MOBILE CHARGER CUM EMERGENCY LIGHT: - It works as we do cycling for exercise. Besides charging Mobile battery, it burns the extra calories too. Further it can modified to churn any thing.

HYBRID CHIMNEY : The dual natural energy sources say Wind and Sun energy is used to generate electrical energy. A good alternate source of energy for areas like deserts or barren land, where sun light is available but low speed of wind flow is there.

SOLAR POWERED REFREGERATOR: Compressor less refrigerator to provide 12-15 degree temperature while cooling and is also used to heat if required with the same Thermo-EMF peltier junction based system works on 12V battery to be charged with Solar Cells/ Panel.

ELECTRICAL ENERGY FROM COMPRESSED AIR- This 'AIR GENERATOR' generate electrical energy from the air stored in a storage chamber using suitable air compressor.

ELECTRICITY FROM D.J. DANCE FLOOR: An alternate source or energy can be generated by the modified dance floor using pressure sensor based electricity generators.

WIND BELT: Another alternate energy generation to charge battery by low power wind, say simple fan etc. A moving belt vibrate when wind strike it from any side. The magnets on both ends make the generation of electrical energy .

ROBOTIC VEHICLES AND RELATED PROJECTS

ROBOTIC CAR WITH SENSORS: - This is a simple geared motorized vehicle with free wheel at front will always take right turn when the Infrared sensors sense any obstacle in front. An emergency brake can be applied if required.

JOY STICK CONTROLLED ROBOTIC CRANE WITH UP/DOWN PULLEY ARRANGEMENT AND CIRCULAR MOTION: - This is an interesting project in the field of material handling. A moving trolley carries a circular disc type-rotating platform with crane arm. It moves all 360 degree.

LINE TRACER INDUSTRIAL VEHICLE: A material handling vehicle to carry goods in industry and that follow black line to follow. Any obstacle in front will stop the vehicle to avoid any accident by using IR or ultrasonic sensors.

ROBOTIC RADAR SYSTEM: - This robotic radar moves 180 degree carries an IR or light sensor fires with an electromechanical Gun if finds some object.

ROBOTIC FIRE BRIGADE TROLLEY: - This robotic motorized trolley carries with water tank with it and work automatically if finds the fire in its route.

ROBOTIC LIFT/ ESCALATOR: - This electromechanically System control the model with keys operation for its clockwise and anticlock movement. It may also controlled automatically with human sensor to save energy.

OTHER PROJECTS

LOCOMOTIVE COACH CLEANER: - The model shows how the locomotives can be washed from both sides using brush arrangement with motors.

EXERCISE/PSYCHIOTHERAPY MACHINES: - Numerous types of machines can be made under this topic with automation.

GAS BURNER TYPE WATER HEATER: The modified arrangement of heat water with burner and gas cylinder. It saves 25 to 30% of LPG gas in comparison to ordinary gas stove to heat water.

COMPRESSOR LESS THERMO-EMF REFRIGERATOR: The fibre made box is being modified as simple compressor less refrigerator to provide 12-15 degree temperature while cooling and is also used to heat if required with the same Thermo-EMF peltier junction based system.

DEEP FREEZER USING COMPRESSOR: A simple compressor based food stuff storage system with the top opening glass lid. The project shows the use of compressor in practical shape with voltmeter, ampere meter at display.

COOLING TOWER: The multi layer cooling tower will cool the liquid or water with the help of water pump.

COMPRESSOR BASED SPRAY GUN: The mini electric compressor is used to spray the water colours.

PAPER SHREDDING MACHINE: The project will cut the papers in small pieces to make the use for packing etc.

SUN BLIND CONTROL: - It control the movement of sun shade as per Sun light falling on the window.

HEAT EXCHANGER-PIPES: The smart cooling system to cool the heat effected area required continuous cooling as on CPU of systems or machines that radiates heat.

ANALYSIS OF RECTANGULAR /TRIANGULAR FINS IN HEAT EXCHANGE MACHANISM: An arrangement will help to study the heat exchange efficiency using different types of fins in a rectangular heat pipe.

MOTORISED ELECTRIC AIR COMPRESSOR: The motorized arrangement with air pump to store air to be required later.

ENGINE BASED AIR COMPRESSOR: A 12000 rpm 2.5 CC or 3.2 CC diesel engine work on the mix blend of Kerosene, Ether Solvent and Castor Oil with manual start will create a sufficient air pressure to show the working.

360 MOTION AIR FLOW COOLER WITH DUAL SIDE AIR FLOW: A smart cooler with moving blower that circulated the air in all 360 degree of motion all around.

DOOR OPENER: - Automatic gate/Door opener that sense the human presence and open the door with mechanical motorized arrangement.

MOVING BRIDGE: The geared motor arrangement to lift the bridge on river in case of free movement of Ships/Boats required.

CURTAIN MOVER: - A mechanical arrangement with optional battery operated sutomatic remote controlled curtain movers. Useful for stage show etc.

EARTH MOVERS:

TOFFEE/PACKET VENDING MACHINE: - An automatic coin vending machine that give you a packet (say Matchbox) or Toffee when you insert a 1 rupee coin in it. This is a timer based motorized Mechanical arrangement.

SOLENOID BASED HAMMER: A electro-mechanical arrangement with IR sensor in front to drill any hard surface area using solenoid coil arrangement.

TORQUE TESTING DEVICE: The device comprises a moving wheel with motor and an arrangement to check the torque of that motor to carry the weight etc.

LIQUID DISPENSER MACHINE (WITH AIR CONTROL SYSTEM): The timer operated arrangement can be used to dispense liquid from the source to fill any liquid say milk/juice/petrol etc. This can be displayed using conveyor belt system to make the model more presentable.

AIR COMPRESSED SPRAY GUN (WITH ELECTRIC AIR PUMP): The air pump controlled spray gun for minor paint jobs normally required by automobile workshops or artists.

LATHE TOOL PRESSURE DYNAMOMETER: A microcontroller based project is to calculate the pressure formed at the tip of lathe tool so that one must sure that

SOLENOID BASED DRILLING /PUNCHING MACHINE WITH AUTOMATIC TIMER BASED/IR SENSOR: The good project for automation in mechanical using a drilling or punching system that operates automatically when object or work piece is placed under this.

SUN TRAKKING WATER HEATER WITH MECH. PROCESS (WATER DROP ETC.) A unique system that uses water itself to get maximum energy to heat water from sun energy. The concept is to tap sun energy by means of sun tracking system. Also known as Solar Oven.

DRINKING WATER FROM OCEAN WATER: An arrangement to convert sea water into drinkable water with high speed evaporation and cooling & condensation process.

TEST-TUBE VIBRATING MACHINE WITH DUAL CONTROL- The arrangement allows the bottles placed in a chamber to rotate with different angle and at different speed to mix the setup.

AUTOMATIC VENTILATOR FOR WINDOWS PANELS: The mechanical arrangement open the ventilators automatically when it sensor more heat or humidity in a closed area.

LATH MACHINE CONTROLLER: A digital arrangement to move two motors automatically to complete a process job with a specified speed and time frame.

AC COIL CLEANING SYSTEM : Project will ease the process of cleaning for coils or similar system normally used in AC plants or even wire mesh in chimneys.

MOTORISED WHEEL CHAIR: The useful device for handicapped person to mive the chair with the help of battery and motor arrangement. The keys will help to turn left or right side.

ENGINE BASED GENERATOR : A 2.5 CC or 3.2 CC diesel engine work on the mix blend of Kerosene, Ether Solvent and Castor Oil with manual start will charge the battery or directly run small current operated devices.

PADDLE CONTROLLED DOOR OPENING SYSTEM: A very good project for security persons to open or close the barrier or iron grill gates using paddle system.

ACCIDENTAL PROOF TRAINS USING RF SIGNALS : The automatic braking system that makes an emergency brakes if two trains are coming on the same track. The model showing with one static and one moving train on a track.

HEART BEAT PULSE PLOTTER MACHINE : This will draw the pulses from heart using a finger sensor and will put on paper with the help of solenoid coil assembly.

LAPPING MACHINE: Lapping is an abrading process that is used to produce geometrically true surfaces, correct minor surface imperfections, improve dimensional accuracy , or provide a very close fit close between two contact surfaces.

MAGNETIC LEVITATION PLATFORM: (A) A permanent magnet parallel rails pulls up the small platform upward and a electromagnetic system pushes the same from one end to other.(B) Same rail and platform system as above with a dc motor propeller system to run the car.

MOVING ESCALATORS: The moving arrangement of stairs to move persons from one floor to another by using IR sensor to detect human presence to save energy.

AUTOMATIC MOPPING MACHINE: The sensor based mopping machine will change the path automatically and runs in a room to clean the floor area.

AUTOMATIC MILLING MACHINE: The three/two axis motor control system to be run automatically with a digital circuit.

PCB FABRICATION: Every electronic workbench needs a PCB (PRINTED CIRCUIT BOARD) to be fabricated to make any electronic circuit.

UNMANNED RAILWAY CROSSING : A crossing barrier gates will automatically close down mechanically when it sense the train is coming and open it after the train crosses the barrier gate at unmanned crossing area to prevent accident.

AUTOMATIC PAPER LIFTING AND STAMPING MACHINE:

PROJECTS IN AUTOMOBILE/TRANSPORT MECHANICAL:

REGENERATIVE BRAKING SYSTEM: - The system will generate electrical energy while the wheel is about to stop when applying brakes. The model comprises a moving wheel arrangement with induction braking system that create regeneration of electrical energy to charge the battery again to save energy about 20%.

INDUCTION BRAKING: An alternate Electromagnetic braking arrangement to stop the vehicle without wear and tear of shoe brakes. It can be used by Industries to stop machines using this SWITCH BRAKES.

ANTI LOCK SENSOTRONIC BRAKING SYSTEM: The concept behind this project is to demonstrate the wheel braking by electronic system with change in brake timing using simple shoe brake.

PROPELLER BASED FORMULA CAR: A 2.5 CC or 3.2 CC diesel engine work on the mix blend of Kerosene, Ether Solvent and Castor Oil with manual start will rotate the propeller blade in front of car and the air pressure provides the power to run this Formula Car . An RF remote control unit can be used to provide direction on either side.

DIESEL ENGINE BASED CLUCH CONTROLLED CAR:

A 2.5 CC or 3.2 CC diesel engine work on the mix blend of Kerosene, Ether Solvent and Castor Oil with manual start will rotate provides the power to run this Car . A clutch arrangement operates on RF link will control the whole assembly for speed and direction on either side.

DIESEL ENGINE LOCOMOTIVE MODEL: A 2.5 CC or 3.2 CC diesel engine work on the mix blend of Kerosene, Ether Solvent and Castor Oil with manual start will rotate the gears assembly that provides the power to run this Locomotive engine. The whole structure can be placed on rail tracks.

PROPELLER/MOTORISED MONO RAIL: This simple propeller based vehicle will run on the principle of air propel ion. The speed of vehicle is directly propotional to the speed of propeller blades.

PNEMATIC TRANSPORT SYSTEM: An Age old technique can be used again to transport the low weight material from one place to another in industries.

HYDRAULIC BREAKES: - A same mech. System that uses fluid as pressure to move the brake shoes in moving wheels for braking systems.

HYBRID CAR – ENGINE AND DC MOTOR OPERATED DUAL POWER CAR: A 2.5 CC or 3.2 CC diesel engine work on the mix blend of Kerosene, Ether Solvent and Castor Oil with manual start will rotate the propeller blade in front of car and the air pressure provides the power to run this Formula Car .The solar cells on the top provide additional power to charge battery and it will also run the car to save fuel. An RF remote control unit can be used to provide direction on either side.

WIRELESS TYRE PRESSURE GAUGE: The microcontroller based project send the data from tube/tyre rim to the dash board for the pressure of each tube. One can read at the attached LCD on the project.

DRIVER LESS CAR: The three wheeler car that sense the path at its own (or follow black line at the surface). It will aply brakes in someone comes in front of it or change the path left or right as per requirement.

HYDRAULIC BRAKING SYSTEM FOR CAR/IND. APPLICATION : The paddle operated or IR sensor operated hydraulic braking system with piston and oil chamber connected to a motorized rotating wheel.

STEERING CONTROLLED HEADLIGHT: The four wheeler usually find difficulty to drive in hills specially at sharp turns. The model help them to change the focus of headlight as the steering moves on either direction.

ENGINE/MOTOR VIBRATION CHECKER: The microcontroller based setup reads the vibration of engine or motor. This helps to tune the engine to get maximum efficiency with fuel savings.

IR AUTO BRAKING: A simple auto braking in material handling robot that stops automatically when the obstracle comes in between. It create a switch, induction or paddle brake to apply to stop the vehicle.

SEAT BELT AUTOMATIC: - An innovative idea to automat the seat belt locking system using motor with parallel gear arrangement with timer circuit. The arrangement itself attached inside the car to provide the facility.

ACTUAL CAR LIFTING JACK: A MOTORISED JACK: It actually lift the car using its own car battery as power source.

ELECTROMAGNETIC SHOCK ABSORBER: A modified shock absorber that activates automatically when it sense the potholes on the road. It comprises road sensors that provide instant response to act while driving.

STEERING BY WIRE : A DC geared motorized arrangement to replace existing steering system by switch arrangement.

HYDRAULIC /COMPRESSED AIR BASED LIFTING JACK: An air engine provide pressure to uplift the jack comprises piston filled with oil.

HOOVER CRAFT USING ENGINE: A 2.5 CC or 3.2 CC diesel engine work on the mix blend of Kerosene, Ether Solvent and Castor Oil with manual start will rotate the propeller blade and the air pressure provides the power to run the Hoover Craft. An RF remote control unit can be used to provide direction on either side.

AIR PROPELLED MOTOR BOAT: A DC motor operated boat operates on propeller blade and the air pressure provides the power to run the boat. An RF remote control unit can be used to provide direction on either side.

AMPHIBEAN ROBOTIC CAR: The Air propelled or water propelled boat cum car that runs on water and surface both. The RF modules can be placed to control the same remotely.

MICROCONTROLLER AT-89C51 BASED AUTO GEAR SHIFTING SYSTEM: The circuit shows the demo of auto shifting of gears using stepper motor with the change in speed of vehicle. One can change the speed of DC motor as actual vehicle running wheel

MICROCONTROLLER AT-89C51 BASED AUTO SPEED LIMITER WITH AUTO BREAKING: The project is to read the rpm of a automobile and according to that it limits the speed as Speed Governor. One can change the speed with variable control.

DIGITAL AUTO SPEED LIMITER: For limit the speed suto.. if a school or hospital comes in way.

ELECTROMACHANICAL BRAKE : A moving wheel with permanent magnets will change the flux at the outer ring. The electromagnets can produce electrical energy to charge battery or can be used to make brake on that wheel.

SOLAR TRICYCLE FOR KIDS: It runs on DC motor placed under the seat with chain drive. The mains operated charger with Solar power charging option is an added attraction of this model.

SOLAR TOY CAR: -The solar panel charge the battery. From this rechargeable battery a dc geared motor drive the mini toy car. RF remote operation for steering control is also an optional attachment.

COLLAPSIBLE STEERING MACHANISM: The model shows the basics of Steering system with collapsible mechanism. The project consist of two front wheels with steering system and an attachment for collapsible parts in case of frontal accident.

HYBRID MOTORBIKE: The ordinary bike can be converted into HYBRID vehicle as the bike battery will provide power as alternative source when it get fully charged.

FOUR WHEEL STEERING SYSTEM: The driving on the hills will get more easy with this mechanism.

CONTINEOUS VARIABLE TRANSMISSION: A new technique to run a vehicle without using clutch to change the speed in continuous mode.

ELECTROMAGNETIC BRAKE USING BRAKE SHOE: The electromaganet will expand the brake shoes to activate the braking machanism. More the current , Easy to brake.

DISC OR CLUTCH BRAKE SYSTEM IN AUTOMOBILES:

PC BASED MECHANICAL PROJECTS

PLEASE NOTE

PROJECTS IN THIS LIST ARE TO BE INTERFACED WITH PARALLEL PORT (25 PIN CONNECTOR AT THE CPU) OR SERIAL PORT IF SPECIFIED. ALL THE HARDWARE PROJECTS WILL COMMUNICATE WITH PC WHILE EXECUTING THE SOFTWARE WRITTEN FOR THAT APPLICATION.

PC BASED IC-INTERNAL COMBUSTION ENGINE: An animated software project shows the working of combustion engine and the hardware connected will actually shows the rpm of engine.

PC BASED SEWER LINE CLEANING ROBOT: It's a 3d moving circular cleaner that rotates and clean the inner surfaces of sewer pipes and communicate with PC of its presence etc.

PC BASED ROBOTIC TROLLEY: - A single/double stepper motor based trolley with an additional MOTOR will run in straight direction to load/unload the material handling. One can select the stoppage as per requirement and it automatically return back if obstruction comes into the path.

PC BASED LIFT/ELEVATOR CONTROLLER: - A useful project for all multistory building to monitor lift operation and control both from lift switches and computer keyboard. The PC screen will show the graphical representation of the lift up/down movement. Operates with single stepper Or geared motor control.

PC BASED DISTANCE MEASUREMENT ROBOT: - The IR based robotic trolley with to and fro movement can travel in a straight pipe to measure the distance traveled till the obstruction come.

PC BASED LATH MACHINE CONTROL: - A CNC machine control system to operate two stepper motors in a desired mode to cut works a work piece in specific shape and size.

PC BASED AUTO BRAKING SYSTEM: - A unique project for automobiles/vehicles that sense the rpm of the engine and automatically apply the brakes if speed exceeds the specified limit.

PC BASED FORK LIFTER: - This Fork lifter lift the floor items and place at the required space as instructed by the computer using stepper motor

PC BASED EARTHQUAKE PROOF BUILDING: - The center of gravity of a building can be motorized controlled by a moving weights placed on the rooftop. The PC will sense the earthquake and weight move accordingly.

PC BASED STICKER/PAPER CUTTING MACHINE: - This PC based parallel port interfaced cutter and motor control circuit will cut the paper or sticker according to one's requirement.

PC BASED THREAD/COIL WINDING MACHINE: - This PC based automatic thread winding machine needs the no of turns required as input. The cutters will automatically cut after the desired output

PC BASED CONTINEOUS WELDING VEHICLE: An GV(Automatic guided Vehicle) controlled with computer will follow the routes specified once using keyboard and further it will follow the same to work as contineous welding vehicle or Fire brigade vehicle or material handling vehicle to drop things.

PC BASED DIE CUTTING: - A CNC based automatic system controlled with digital circuit or PC controlled that operates two motors to do the job for up/down of the tool and movement of the base sheet to cut.

PC BASED HELICOPTER CONTROL: - This PC based system control the top fan and tail fan with balance movement when you would like to

PC BASED JOINT ASSEMBLY PROJECT: - A mechanical graphic project to plot two type of joint viz. cotter & knuckle. The hardware assembly can be connected as per requirement.

PC BASED AUTO PACKET VENDING MACHINE: The packets/juice cans or any other items can be vend by putting password in the computer.

PC BASED ROBOTIC SWEEPER: The PC controlled sweeper will perform the job as per schedule and the area /route defined.

PC BASED ATM MACHINE: One can open the account and get the hard money in the shape of coins.

PC BASED PROGRAMMABLE PAINT MACHINE: - A PC based Programmable paint machine is CNC type system that completes its work as shedule task given.

PC BASED CAR PARKING MONITOR: - A 20 cars parking monitor cum control system that check and enter the time and registration no. of each can while entry and exit with IR/LASER sensors at gate. Parking full indication

PC/MECHINICAL BASED TIME OPERATED FOIL BENDING / DONA MAKING MACHINE: The stepper motorized based system that manufacture/process time operated system like bending machine.

PC BASED 3D XYZ AXIS MOTOR (MATRIX) CONTROL: - (a) The two stepper motors can be controlled jointly with the single command operation to operate two XY Axis motions to form a matrix at PC screen and a geared motor can be manually operated to lift or release the material picked by hook or electromagnet.

PC BASED SCREW/DRILL SYSTEM: - This two stepper motor controlled system either use to screw with the moving bolt jack arrangement or it can be used to drill up to desired depth at a specific space.

PC BASED HEIGHT MEASUREMENT TOOL: - A rotating disk operated with stepper motor stops at every 180 degree and read the height of the present