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Alcohol Sensing Alert with Engine Locking System

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***Abstract:** This system is a visionary approach to help accidents caused by drunk driving, rather than staying for an accidentto be and also trying to remedy thesituation. Theuseof technology in precluding drunk driving has proven to be an effective tool in saving lives and precluding injuries on the road. The perpetration of the alcohol machine cinch system withMQ3detector has been met with some resistance from those who feel that it infringes on their particular freedoms. still, it's important to flash back that the safety of all road druggiesshould be a top precedence. The use of the system can help reduce the number of accidents causedbydrunkdriving andeventuallysavelives. It'sasmallpricetopayforthesafetyofall road druggies. In conclusion, the alcohol machine cinch system with MQ3 detector is a critical technology in precluding alcohol- related accidents on the road. This system has been successfullyenforced incolorfulcountriesaroundtheworldandhasproventobeaneffective tool in reducing the number of accidents 4 caused by drunk driving. As the notorious saying goes," Safety does not be by accident." It's over to all of us to take visionary measures to insure the safety of ourselves and others on the road.*

I. INTRODUCTION

Thealcoholsensorandmachine lockingsystemisdesignedtohelpdrunkdriving,which isa major cause of accidents and losses on the road. It has been enforced in colorful forms in different countries, and in some places, it's obligatory for certain motorists, similar as those with previous DUI persuasions or marketable motorists. Drunk driving is a serious problem in numerous countries around the world. According to the National Highway Traffic Safety Administration(NHTSA), in 2019, 10, 142people failed in alcohol-bloodied crashes in the UnitedStatesalone. Toaddressthisissue,colorfultechnologieshavebeendevelopedtohelp drunk driving, including the alcohol sensor and machine locking system.

II. RELATED WORK

Multitudinoussweatshavebeenmadeinrecenttimestodevelopsystemsthathelp help drunk driving, especially by exercising detector-grounded technologies and bedded systems.

1) Alcoholsensingwith MQ3Detector : TheMQ3detectorhas beenextensivelyused in earlier systems for detecting alcohol situations through breath analysis. utmost of thesesystemswerelimitedtosimplecautions likebuzzersoradvisinglights,without taking any direct action to control the vehicle.
2) EngineStartPreventionSystems:Somemarketableresultsincorporatebreathanalyzers linked to the vehicle's ignition.However, the machine remains locked, If alcoholisdetected.still,similarsystemsarefrequentlyexpensiveandaren'tdesigned for nonstop, real-time monitoring while the vehicle is in use.
3) Vehicle Speed Regulation :Being explorationhasexploredautomatics peedregulationinvehicles, primarilyfor safety orcomfortpurposes. still,integrationof these features with alcohol discovery has infrequently been explored in a single, unified system.
4) EmergencyAlert:UsingGSMModulesGSMtechnologyhasbeenpreliminarily used in safety systems to notify connections in case of extremities like theft or accidents. A many prototypes included drunk driving cautions, though utmost demanded active vehicle intervention capabilities.
5) Use of Microcontrollers : Microcontrollers similar as the Arduino Uno and Raspberry Pi have been used in earlier designs to manage detectors and cautions. Comparedto these,theArduinoNanooffersamorecompactandeffectiveoptionfor bedded automotive systems.

III. SYSTEM DESIGNAND ARCHITECTURE

A. *Hardware Components*

ThealcoholsensingalertSystemis builtaroundthefollowingkeyhardwarecomponents

1) AlcoholSensor(e.g.,MQ-3):Thissensordetectsthepresenceand concentrationof alcohol in the driver's breath.
2) Microcontroller(e.g.,Arduino):Thisprocessesthedatafromthealcoholsensorand controls the other components, such as the relay and buzzer.

3) Relay:Thisactsasaswitchto controltheengine'signitionorotherfunctions,suchas locking the engine if alcohol levels exceed a threshold.
4) Buzzer:Thisprovidesanaudiblealerttothedriverwhenalcohol isdetected.
5) LCDDisplay(Optional)**:**Thiscandisplaythealcohollevelorotherrelevant information.
6) GSMModule(Optional):Thisallowsthesystemto sendalertsto authoritiesor designated contacts via SMS or other communication method

B. Pin Configuration Overview

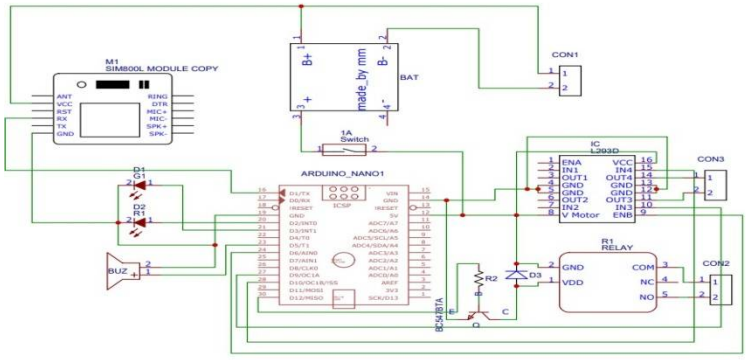
Thefollowingtableoutlinethepinconfigurationfor theATmega328Pmicrocontroller and its connection to other components:
ComponentsATmega328ppinno.
12V battery ArduinoNano MQ-3 sensor Relays
12V DC supply to 5V DC voltageregulator(LM7805) Buzzer
LEDindicator
GSMmodule(SIM800LorSIM900A)

C. Circuit Operation

Thesystemoperatorsasfollow:
1) AlcoholSensor:Thecorecomponentisanalcoholsensor,oftenanMQ3module, which detects ethanol in the air.
2) MQ-3GasSensor–Detectsalcoholconcentrationinthe air.
3) Microcontroller(e.g.,Arduino,8051,orRaspberryPi)–Processesdatafromthe sensor.
4) BuzzerorAlarm –Alertswhenalcoholis detected.
5) LEDIndicators –Showsstatus(e.g.,greenforsafe,redfor alert).
6) Display(Optional)–Showsalcohollevelorwarning messages.
7) Relay(Optional)–Canbeusedtodisablevehicleignition.

D. Circuit Operation

The complete circuit illustration of alcohol seeing alert system is illustrated inbelowillustration.Theillustrationshowstheconnectionof allthefactorswiththeAtmega328P Microcontroller, icing the accompanied operation for sure alcohol discovery and alert functionality



IV. SYSTEM WORK FLOW

Thealcoholsensingalertsystemfollowsastructured workflowtoensuresecureandefficient operation.

1) *Case1:AlcoholDetected BeforeDriving(Caris Stopped)*

- Thedriverentersthevehicleandtriestostarttheignition.
- TheMQ3sensordetectsalcoholin breath.
- Ifalcohol isabovethelegalthreshold,theignitionremainslocked.

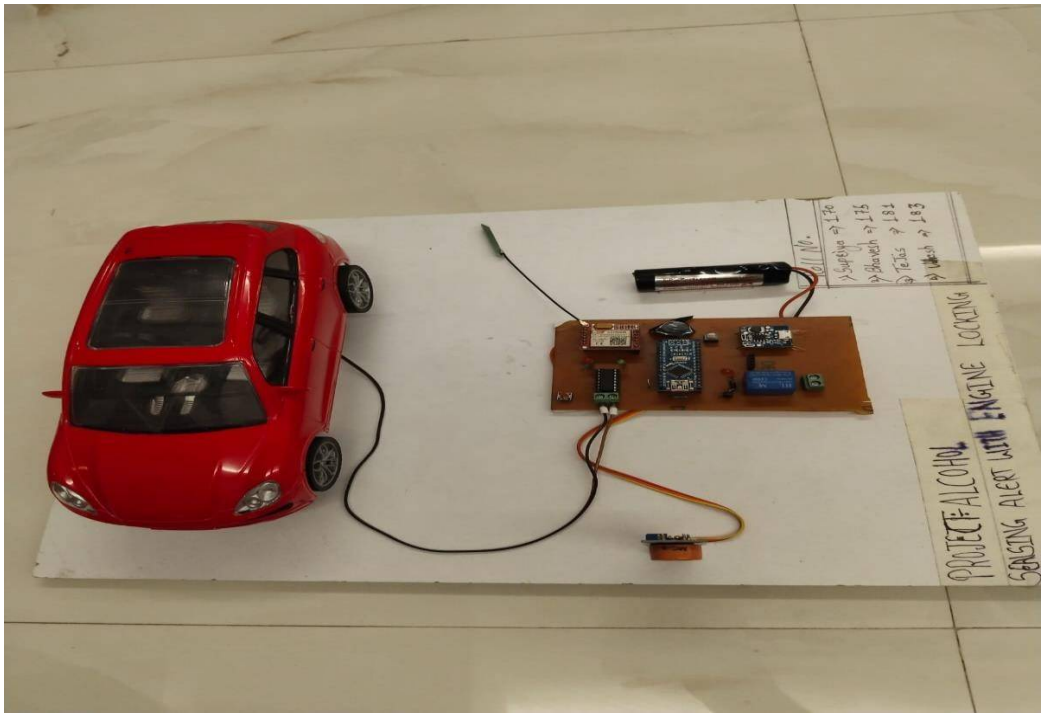
- Thedrivermustsoberuptostartthevehicle.

2) Case2:AlcoholDetectedWhileDriving(CarisinMotion)

- Thedriverstartsdriving.
- TheMQ3sensorcontinuouslymonitorsalcohollevels.
- Ifalcoholisdetected,theArduinosendssignalstothespeedcontrolsystem.
- Thevehiclespeedgraduallydecreasesuntilitcomestoasafestop.
- Theignitionremainslockeduntilthedriveris inanormalcondition.

V. RESULT AND DISCUSSION

Thefully implementedalcoholsensingalertsystemwastestedunderthevarious scenarios:



VI. CONCLUSION

In conclusion, the alcohol sensor and machine locking system is an important safety point that can potentially save lives and help accidents. It directly measures a motorist's Bac position and prevents them from operating their vehicle if their position is above the legal limit. still, the system also has limitations, similar as the possibility of motorists trying to bypassitandthecostofinstallation.Overall,thealcoholsensorandmachinelockingsystem is a precious tool in precluding drunk driving, but it is n't a cover for responsible driving geste and public education juggernauts about the troubles of drunk driving.

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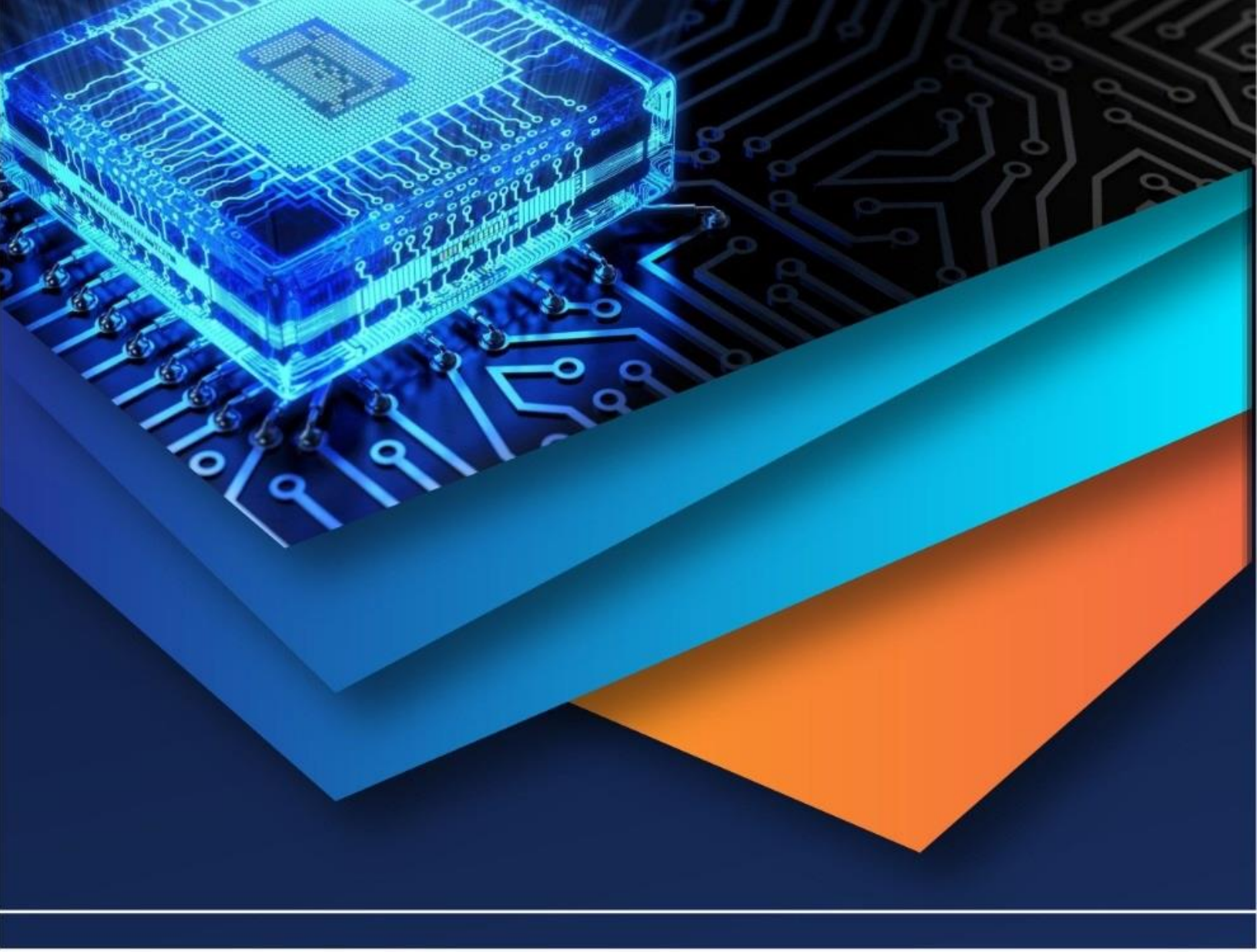

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