ECE 411 Project Ideas
Team 14

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Project Idea 1

Description: Exhaust muffler for electric cars that generates fake exhaust sounds, making electric vehicles sound like traditional internal combustion engines.
Sensors: Accelerometer, throttle position sensor
Controllers: Arduino Uno, or ESP32
Actuators: Speakers, amplifier

Project Idea 2

Description: A watch that monitors vital signs such as heart rate and body temperature and activates an alert (vibration) if abnormal readings are detected.
Sensors: Heart rate sensor, body temperature sensor
Controllers: Arduino Nano or ESP32
Actuators: Vibration motor or LED or a small display screen (for alerts)
https://www.instructables.com/DIY-Fitness-Tracker-Smart-Watch-With-Oximeter-and-/

Project Idea 3

Description: An RFID-based door lock system that uses an RFID scanner to authenticate access, with an LCD display to show the lock status, a manual push button for unlocking from inside, and a solenoid lock for controlling the door.
Sensors: RFID reader (RC522)
Controllers: Arduino
Actuators: Solenoid lock, Buzzer, LEDs
https://www.youtube.com/watch?v=EJKUcGIfNDU

Go-to Project Decision

We chose Project Idea 1 because it enhances the driving experience of an electric vehicle by imitating a traditional engine sound. This also offers the engine-sound enthusiast a familiar sound experience to switch to EVs, which is better for the environment and costs less to maintain. The project has all the requirements, plus some additional sensors we might add in if we have time.