

## VEHICLE THEFT DETECTION AND ENGINE LOCKING SYSTEM USING ARDUINO

**Y.MANISH**

Roll No : 20233-EC-011

ECE

Mahaveer Institute Of  
Science And Technology.  
Manishmani27364@gmai  
l.com

**B.YASWANTH**

**VARMA**

Roll No : 20233-EC-002

ECE

Mahaveer Institute Of  
Science And Technology.  
yaswanthvarma897@gma  
il.com

**P.VEERA BABU**

Roll No : 20233-EC-031

ECE

Mahaveer Institute Of  
Science And Technology.  
Veerudon325@gmail.co  
m

**D.VISHNU VARDHAN**

Roll No : 20233-EC-019

ECE

Mahaveer Institute Of Science And  
Technology.  
vishnuvardhan00031@gmail.com

**M.Devaraju**

Associate Professor

Dept.of Electronics and Communication  
Engineering  
Mahaveer Institute Of Science And  
Technology.  
devamraju@gmail.com

### ABSTRACT

Nowadays, As vehicle based transportation is significant in today life for all emergency, societal, household applications we need to provide a solution for safety of the vehicle by an anti theft detection system and engine lock system. This system includes both the technologies (GPS) and (GSM) which increase the security rate by providing information and location about the vehicle. After finding alert notification, owner sends back a message to GSM which is again interact with ARDUINO to deactivate the system. A vehicle theft detection and engine locking system using ARDUINO can helps the user to identify the vehicle in theft mode and enables the controlling mechanism. All the factors make it cost effective and efficient anti theft vehicle system. The idea and scope of the project work is to emerge and to acquire a good understanding of the rapidly evolving field of Tele communications network and mobile phones using GSM technology. Generally, everybody knows that the mobile is used for personal communications, but very few people know that same mobile phones can also be used for many other applications. In this regard, here the GSM technology is used to enhance the vehicle safety. To prove the concept practically, a GSM modem with a service number is essential. The

GSM module must be installed in the vehicle itself, it should not be used for other applications. The main function this modem is to transmit a message to the authorized mobile number when the vehicle is started by unauthorized person. The GSM modem which is supposed to be installed in the vehicle and the electronic circuit along with its peripherals, which is interfaced with this modem, the entire system must be arranged in the vehicle in a secret place.

### 1.1 INTRODUCTION

The idea and scope of the project work is to emerge and to acquire a good understanding of the rapidly evolving field of Tele communications net work and mobile phones using GSM technology. Generally, every body knows that the mobile is used for personal communications, but very few people know that same mobile phones can also be used for many other applications. In this regard, here the GSM technology is used to enhance the vehicle safety. To prove the concept practically, a GSM modem with a service number is essential. The GSM

module must be installed in the vehicle itself, it should not be used for other applications, the main function this modem is to transmit an SMS when an unauthorized person tries to start your vehicle to the authorized mobile phone. The GSM modem which is supposed to be installed in the vehicle and the electronic control circuit along with its peripherals, which is interfaced with this modem, the entire system must be arranged in the vehicle in a secret place.

To avoid un-authorized persons operation, some code word can be implemented in the system, such that only owner of the vehicle can access the system. Means, for starting the vehicle a pass word is to be entered and the enter button is to be pressed. If the password matches the vehicle will be started indicating by the operating of the DC motor. And if the password is wrong, a message will be sent to the mobile number that is defined in the controller program. This project work is designed based on GSM (Global system for mobile communications) technology, falls under the subject of communication field. The advantage of using GSM technology is that there is no limitation in the range, because it is a global network, therefore the user can have message wherever the vehicle is stolen. Whenever any person tries to start the vehicle and run away, the controller acquires this information & the same will be transmitted to the concern mobile number automatically through the GSM modem.

#### **FUNCTIONAL DECSRIPTION:**

The microcontroller used in this project work is interfaced with GSM module & it is pre-programmed such that the user

mobile number will be dialed automatically and a message is sent in the form of an SMS. Based on the signal obtained from the ENTER button, when the password is wrong, the controller activates the GSM module, by which a communication link will be initiated between the mobile & GSM module, once the link is established automatically the information will be transmitted to the corresponding mobile phone. Presently the controller is programmed to pass the information to a particular mobile, if required the information can be passed to many mobiles simultaneously.

#### **1.4 PROBLEM STSTEMENT:**

In Bangalore during the recent survey average of 2000 vehicle per day is violating traffic rules. Because of traffic management system high number of traffic jam is happening. Vehicle theft has been increasing in Bangalore. Its slow and not feasible to be tracked by using CCTV footage as the number plates can be easily tampered and it takes lot of human effort in-order to track the missing car.

#### **1.5 AIM OF THE PROJECT:**

Main purpose of the project is to prevent the vehicles from theft by using the the process Vehicle theft detection and engine locking system using Arduino with two major techniques like GSM and GPS. To stopping this issue, there is a need of theft alert system which helps to owner to ensure theft prevention. An vehicle theft detection and engine locking system using arduino technology that helps the user identify the vehicle in theft mode and enables the controlling mechanism technique.

#### **PROPOSED WORK:**

The proposed engine locking method here is Electronic engine locking which is much more efficient than the traditional mechanical engine locking. GSM and GPS technologies are used, which ensure almost the full security of the vehicle as these modules are more reliable and have a vast signal range. GSM module is a chip or circuit that will be used to establish communication between a mobile device or a computing machine and a GSM system. Global Positioning System (GPS) is a satellite-based system that uses satellites and ground stations to measure and compute its position on Earth. In the proposed system, detection of vehicle start, tracking the vehicles location using GPS is being implemented and also remotely locking the engine which is implemented using an android application that will be present with user's phone. In the system the GPS tracks location of vehicle. Here both the ignition key as well as the start button in the app must be used to start/stop the vehicle.

**EXISTING MODEL:**

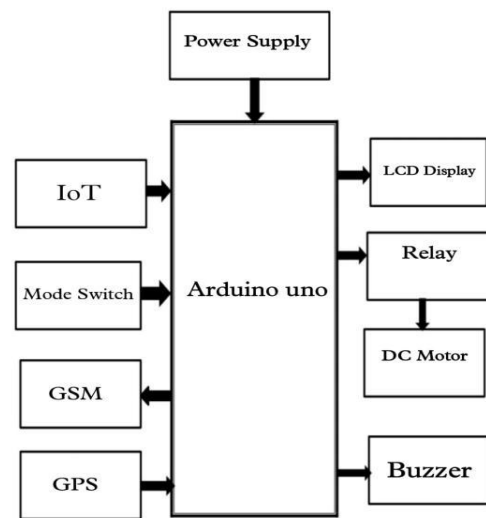
The existing technology mainly uses beepers or alarms and biometrics to the detect the theft. These commercially available products are very high priced. Using a buzzer will help the user to prevent theft in nearby parking condition. If the vehicle is parked far away it becomes difficult to prevent the theft and hence using buzzers is not effective technique. In certain existing the systems the fuel lines are cut off as soon as theft is detected, this might be dangerous at times.

**Drawbacks of existing system:**

In existing system one can only detect if the vehicle is stolen but

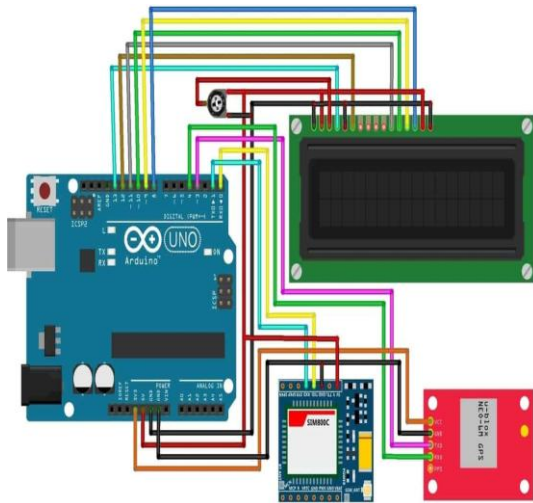
cannot lock the vehicle and any person with the ignition key can start the vehicle. They are **BLOCK DIAGRAM:**

The block diagram consists of Arduino uno is an The Arduino UNO board is used for an electronics project and mostly preferred by the beginners. power supply used in main purpose of is to convert electric current from a source to the correct voltage, current, and frequency to power the load. (GSM) module is designed for wireless radiation monitoring through Short Messaging Service (SMS). GPS information for preparing accurate surveys and maps, taking precise time measurements, tracking position or location, and for navigation.



**Figure : Block diagram**

**SCHEMATIC DIAGRAM:**



**Fig : Schematic diagram of arduino uno**

### WORKING PRINCIPAL:

The vehicle theft is become a major problem that the entire world is facing now. The issue of vehicle theft has increased tremendously, mostly at parks. To stopping this issue, there is a need of theft alert system which helps to owner to ensure theft prevention and provide speedy identification of an unauthorized person who was trying to steal the vehicles. The system aims to help farmers for smart decisions while predicting the crops. To increase the accuracy along with live data, temperature and. To be definite and accurate crop prediction, the project analyzes the temperature and humidity of the field – live data collected using DHT-22. The accuracy obtained by different machine learning techniques is compared to get the most accurate result which in turn will be delivered to the end user. Along with the most suitable crop, the system. The theft alert system makes a use of GPS (Global Positioning System) and GSM (Global System for Mobile) which are embedded in vehicle to communicate with vehicle's owner mobile phone. In GSM technology, the communication established either by an

SMS or calling but we prefer the communication via SMS (between GSM and owner's mobile phone).

### HOW TO SELECT THE ARDUINO BOARD:

#### STEP-1: Check the Processor Chip:

Not all Arduino boards have the same processor chip fitted on them. Different processors offer different speeds and are designed to serve specific functions. For instance, the very famous Arduino UNO (and some other boards) comes with an ATMEGA328 processor that can run with both 3.3V and 5V. It's accompanied by either a 16MHz oscillator or an 8MHz oscillator, depending on the operating voltage. It has a flash memory of 32 kB, a 2 kB SRAM and 1 KB EEPROM.

#### STEP-2: Evaluate the Board's Size:

Yes, not all Arduino boards are the same size or same shape. Some boards are larger than others, and some are circular in shape instead of rectangular. Evaluate and choose an Arduino according to your project. If you're designing something that needs everything to be contained in a small space, then your best choice could be the Mini, Pro Mini, NANO, and MICRO boards because their length ranges from 30 to 48 mm.

#### STEP-3: Know how many I/O

##### Pins:

The number of I/O pins varies with every Arduino board. Arduino MEGA offers the highest number of I/O pins, and it will be your best bet if you plan to use a lot of sensors and modules in your project. you Need An embedded system's CPU serves as the system's brain. Processors

take in user data, process it, and then return an output based on the function they were programmed to perform. Instructions are retrieved, decoded and processed by the processor. So, before purchasing an Arduino board for your project, first calculate the number of pins that would be required by the external components you'll be using, including LCDs, keypads, sensors, modules, etc. and then choose your board accordingly.

**STEP-4: Breadboard capability:**

If you're looking for an Arduino board that can be plugged into your breadboard, then you must go for a Nano or a Micro Board because, unlike other boards, they have male I/O pins, which one can plug into the breadboard.

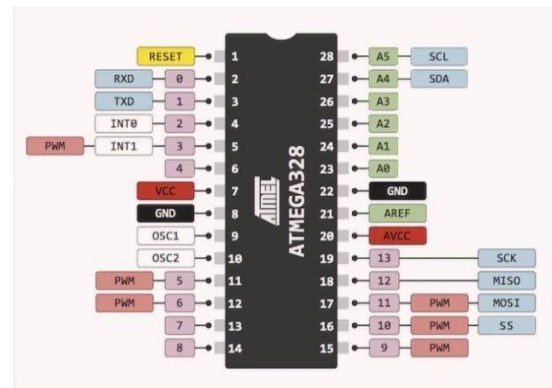
**STEP-5: Assess Operating Voltage**  
 Since Arduino boards have different operating voltages, you should select a board that supports your project's operating voltage and compliments it. Multiple shields can be stacked on top of each other. Some commonly used shields are the WiFi, GPS, and Bluetooth shields, as well as the VoiceBox shield.

**STEP-7: Internet Connectivity:**

A crucial step in choosing the right Arduino board is to consider whether you need an internet connection to run your project or not.

**4.2.9 ATmega328p Description :**

ATmega328P is a very advance and feature rich microcontroller. It is one of a famous microcontroller of Atmel because of its use in arduino UNO board.



**Fig : ATmega328P pin diagram**

is a microcontroller from the Atmel's mega AVR microcontrollers family (Later in It 2016 the Atmel is obtained by Microchip Technology Inc, this family contains different amount of ROM, RAM, I/O pins and other features and also they are manufactured in different output pins which are from 8 pins to hundreds of pins. The internal circuitry of **ATmega328P** is designed with low current consumption features. The chip contains 32 kilobytes of internal flash memory, 1 kilobytes of EEPROM and 2 kilobytes of SRAM.

ATmega328 is commonly used in many projects and autonomous systems where a simple, low-powered, low-cost microcontroller is needed. Perhaps the most common implementation of this chip is on the popular Arduino development platform, namely the Arduino Uno, Arduino Pro Mini and Arduino Nano models.

The Atmega328 has 28 pins. It has 14 digital I/O pins, of which 6 can be used as PWM outputs and 6 analog input pins. These I/O pins account for 20 of the pins.

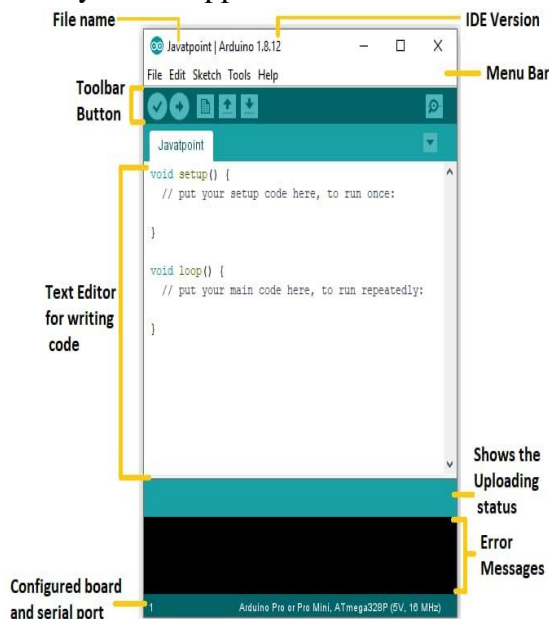
**SOFTWARE REQUIREMENTS**

**ARDUINO IDE DESCRIPTION :**

The Arduino IDE is an open-source software, which is used to write and upload code to the Arduino boards. The IDE application is suitable for different operating systems such as Windows, Mac OS X, and Linux. It supports the programming languages C and C++. Here, IDE stands for Integrated Development Environment.

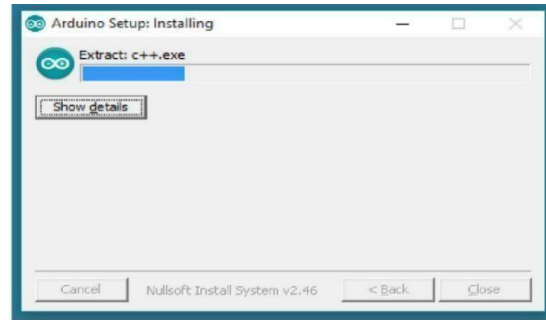
The Arduino Integrated Development Environment - or Arduino Software (IDE) - connects to the Arduino boards to upload programs and communicate with them. Programs written using Arduino Software (IDE) are called sketches. These sketches are written in the text editor and are saved with the file extension .ino.

An integrated development environment (IDE) is a software application that helps programmers develop software code efficiently. It increases developer productivity by combining capabilities such as software editing, building, testing, and packaging in an easy-to-use application.



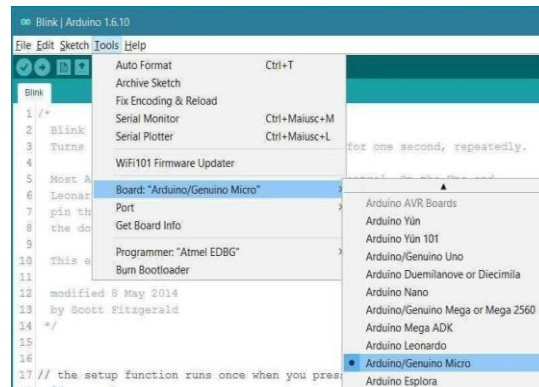
**Fig : Arduino software**  
**Proceed with board specific**

**instructions:**

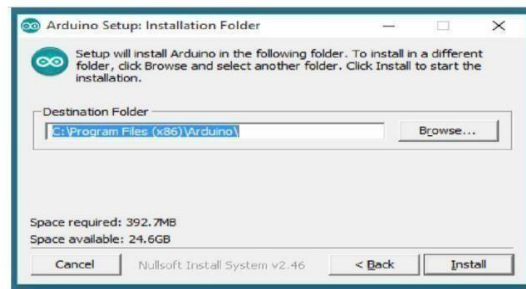


When the Arduino Software (IDE) is properly installed you can go back to the Getting Started Home and choose your board from the list on the right of the page

**Fig : Software program selection**



**Fig : Arduino Program**



**Fig : program detailed check**

The source code for the IDE is released

under the GNU General Public License, version

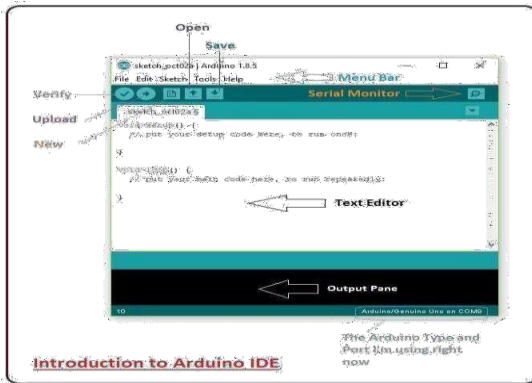
2. The Arduino IDE supports the languages C and C++ using special rules of code structuring. The Arduino IDE supplies a software library from the Wiring project, which provides many common input and output procedures.

The IDE environment is mainly distributed into three sections

- Menu Bar
- Text Editor
- Output Panel

**ARDUINO IDE INTRODUCTION:**

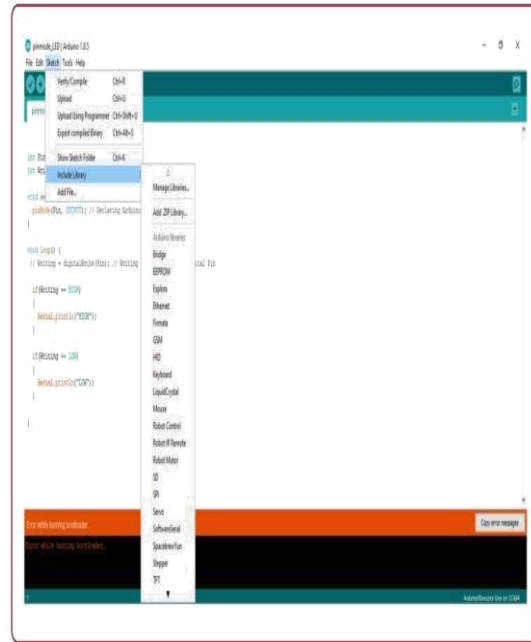
The bar appearing on the top is called Menu Bar that comes with five different options as



**Fig : Menu Bar of Arduino IDE**

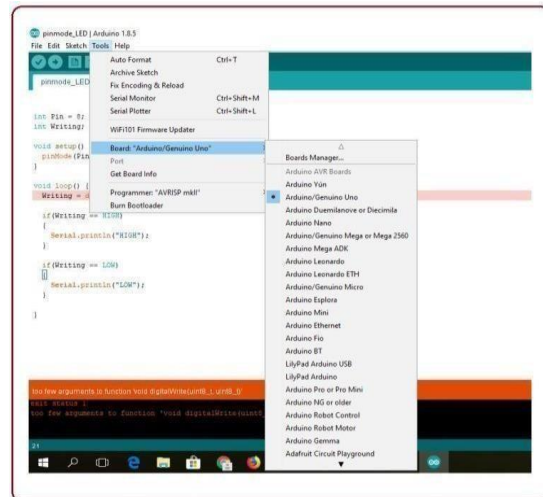
**LIBRARIES:**

Libraries are very useful for adding the extra functionality into the Arduino Module. There is a list of libraries you can add by clicking the Sketch button in the menu Bar and going to include Library.



**Fig : Arduino IDE Library**

As you click the Include Library and Add the respective library it will appear on the top of the sketch with a #include sign. Suppose, I Include the EEPROM library, it will appear on the text editor.



**Fig.5.15: Example**

- The sketch is written in the text editor and is then saved with the file extension

It is important to note that the recent

Arduino Modules will reset automatically as you compile and press the upload button the IDE software, however, older version may require the physical reset on the board.

□ Once you upload the code, TX and RX LEDs will blink on the board, indicating the desired program is running successfully.

### Output results

Here is this project we successfully executed the output and the whole procedure is working as per the results. According to the proposed plan the final outcome of this paper leads to the development of a automation. Here the project we successfully executed the output and the whole procedure is working as per the results. The results of the project are shown below.

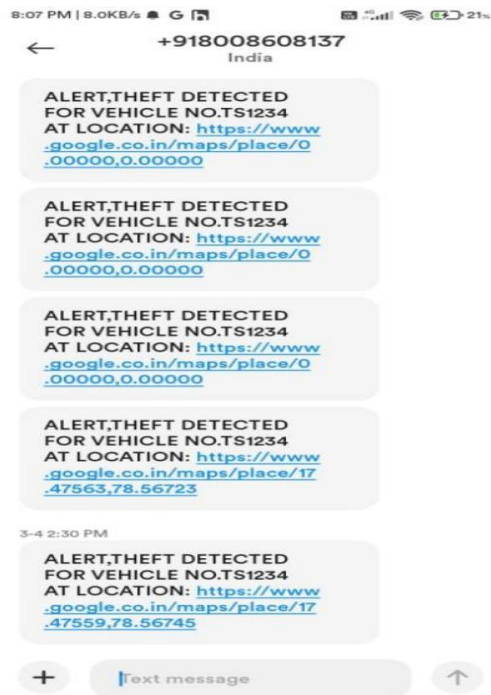


Fig - Alert notifications For thefted vehicle.

### CONCLUSION& FUTURE SCOPE

#### CONCLUSION:

The project work is quite useful for vehicle owners. Basically this is a kind of security system implemented in all government vehicles also in addition to the use of domestic side. Nowadays GPS (Global Positioning System) systems are become popular for tracking the vehicles. These kinds of GPS based systems are implemented in only government vehicles, general public are not allowed to use these systems based on the security environments, other important aspect is, this is not a cost effective system, only government vehicles can afford this system.

In this regard in the view of serving common people at domestic side, this cost effective low cost system is designed for vehicle owners. To prove the concept practically, the proto type module is constructed with microcontroller for live

### PROJECT DEVELOPED KIT DIAGRAM

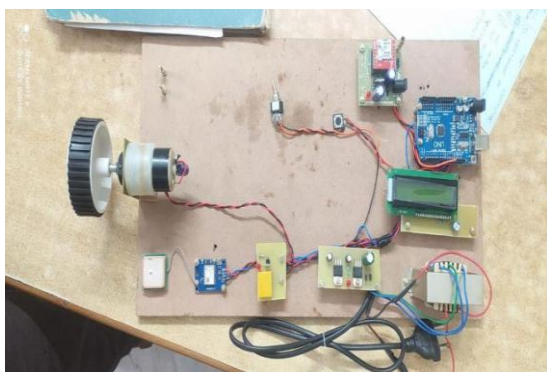


Fig : Project Development Kit



demonstration; results are found to be satisfactory. And further the system can be enhanced using GPS technology also to know where exactly the vehicle is located in case if somehow the vehicle is taken.

#### **FUTURE SCOPE:**

:Further enhancement can be done to this paper by using a GPS system that helps to find out the exact position of the vehicle with the help of its latitude and longitude which then can be sent to the owner of the vehicle via SMS. This system provides instantaneous alerts on the mobile phone of the owner in case of unauthorized use. The owner of the vehicle need not worry anymore about the safety of the vehicle, as anyone who illegally tries to gain access is caught up immediately.

#### **REFERENCE:**

[1] A. Saad and U. Weinmann, —Automotive software engineering and concepts, *GI Jahrestagung*, vol. 34, pp. 318–319, 2003.

[2] E. Nickel, —IBM automotive software foundry, in *Proc. Conf. Comput. Sci. Autom. Ind.*, Frankfurt, Germany, 2003.

[3] M. Wolf, A. Weimerskirch, and T. Wollinger, —State of the art: Embedding security in vehicles, *EURASIP J. Embedded Syst.*, vol. 2007, no. 5, p. 1, 2007.

[4] R. Charette, *This Car Runs on Code*. [Online]. Available:  
<http://www.spectrum.ieee.org/feb09/7649>

[5] T. Nolte, H. Hansson, and L.L. Bello, —Automotive communications past, current and future, in *Proc. IEEE Int. Conf. Emerging Technol. Factory Autom.*, 2005, vol. 1, pp. 992–999.