AutoTuner - White Paper

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1.1 Executive Summary

Everyone has auto troubles, but now we have a complete solution. AutoTuner will act as a bridge between the car and the consumer, and let them know what is going on with the mechanics of their car and guide them to make the right decisions concerning maintenance. The system will read the error codes and diagnostics from your sensors and then communicate that information to the user through their phone. The device is more than just an error code reader though. AutoTuner interprets all of your vehicles diagnostics like fluid levels and error codes and then will suggest maintenance, repairs and parts as well repair shops and part stores nearby to acquire those services. Our system is easily wired into the existing sensors that are in the car using the main unit, which is plugged into the OBD-II port under the dash. We are currently working on making our product compatible with the JOBd (Japanese) and EOBD (European) ports as well. We decided not to develop a system for the older OBD-1 and OBD-1.5 ports since these vehicles lacked the electronics for a full implementation of our product. We will also take special orders for cars that have an EOBD-2 port. The entire installation process will only take 2-hours on most modern cars when coupled with the installation of an optional auto start, remote lock/unlock, alarm system and remote plug-in that all can be used from your phone using the AutoTuner app. To communicate with the user’s phone the AutoTuner features a standard Class 1 Bluetooth broadcaster which will allow the user to use AutoTuner at 100m (330ft) away. A Class 1 broadcaster was chosen to give maximum range to the remote features AutoTuner offers but security is a big concern for some people and so we have made it detachable connected via usb. This way the customer can decrease the range their car will broadcast by plugging in a Class 2 or 3 broadcaster. No matter what the range, our system is password protected by a user defined password that is set up upon initial install so only the user can access their system.
AutoTuner also has voice control for many of its features. It constantly monitors for accidents, and if one occurs AutoTuner contacts EMS using the bluetooth connection to your phone. Unlike our competitors at onstar, we offer this service for free. AutoTuner is the first complete automotive assistant for your phone offering a full range of features for the average vehicle owner.

1.2 Industry-wide Problem

Vehicles come from a number of various countries and manufactures, who all produce their automobiles using different methods and parts. This can be problematic for casual vehicle owners. Most are unaware of how the various components in their vehicle work, nor are they aware of what procedures may be required to keep crucial components in working condition (oil changes, leaky seals, tire pressure, etc). When a check engine light comes on in most peoples vehicles they are often forced to take it to an auto shop without knowing what is wrong or how much it will cost. AutoTuner will guide the user to be more conscious of preventative and service maintenance to their vehicle. More experienced gear heads (slang/generalization) may be aware of how to maintain one type of vehicle, but be required to do the same to a different type of car, where the same procedure is largely different. Because this tool is geared more toward casual users (those who use their vehicle to go from point A to point B), more experienced users aren’t considered as often in this portion of the white paper.

In the event of sudden component failure (a car collision for instance), notifying the user of low pressure in an affected tire is not helpful, however, considering a new tire or wheel in a crash report may be useful for calculating damage costs. Additionally, interpreting the meaning of sensor input and errors can be an indicator what what else might have gone wrong with a specific part of the car. If the car sees the headlights go out, tire pressure drop and the airbags deploy, it may safely assume the car experienced a collision on that part of the car, in which
case, it can suggest checking other vital components in that part of the car.

The automotive industry doesn’t have one solid ‘go-to’ source for maintenance information, pricing and service locations. A number of web sites have search features to find parts for specific makes, models and years of vehicles, however the user must re-enter the information each time they want to search for something. While a large amount of data regarding most vehicle types is available and freely searchable, improvements to the information accessibility could be greatly improved. App support for searching for parts, guides or general information based off a user defined profile about a specific vehicle will improve the ease at which a customer use relevant data to maintain their vehicle.

1.3 Existing Solutions and Drawbacks

There are very few phone apps that use the advantage of Bluetooth technology to wirelessly monitor a vehicle’s diagnostics via its OBD-II port. The few that do exist are very direct and only serve one purpose: to monitor your vehicles diagnostics. The AutoTuner will offer an array of different abilities and be a complete automotive assistant to serve as a bridge between you and your vehicle. The AutoTuner will feature, not only the ability to monitor your vehicles diagnostics, but to suggest tune-ups, repairs, parts/part numbers based on those diagnostics along with approximate estimates. AutoTuner will then suggest local automotive shops and part stores on a map along with reviews by other AutoTuner users. Current apps on the market only relay your vehicles diagnostics to you, which you then have to relay to a mechanic, if you are not one yourself. With AutoTuner those diagnostics are interpreted for the average vehicle owner so that he or she may be guided to make the right decisions concerning maintenance and repairs. AutoTuner will also
double as a remote for your vehicle including features such as auto-start, remote lock/unlock and an alarm system. It will also alert you to ajar doors and lights left on (headlights/cab). There is currently no app on the market that combines the usefulness of a scan tool with the luxury of a remote auto-start, let alone an app that takes each concept a step further adding advanced features as AutoTuner will.

1.4 New, Improved Solution

AutoTuner largely focuses being a complete automotive assistant for the average auto owner. Instead of focusing on one feature, AutoTuner includes consideration for all of your vehicle needs. All diagnostics and sensor values are interpreted and presented in an easy to consume and useful manner instead of giving you raw data. The app also includes implementation for remote capabilities such as auto-start, lock/unlock, alarm and more so that it may be an all encompassing tool for the average auto owner

As was detailed above, sensor values indicated through OBD-II values may have different values from manufacturer to manufacturer, or use different sets of values. The AutoTuner brings a new take on the way the everyday users utilizes these OBD values. Unless a user is taking their vehicle to a mechanic, deciphering the OBD codes are just another step in the diagnosis process - which may prevent casual users from taking proper steps toward properly maintaining their vehicle. Because the AutoTuner reads directly from the bluetooth device connected to the OBD-II port in addition to having a locally stored OBD code database, it skips the step of presenting the user with the code, and gives the description of the problem at hand. For more advanced users and mechanics, there are settings available to display the OBD-II code in addition to the rest of the diagnosis. The
suggested service and maintenance based on diagnostics is prioritized based on importance and necessity.

AutoTuner has integrated support for services and service mapping. Situations may arise in which the user is left stranded along the side of the road with an inoperable vehicle. In some environments, such a scenario can be deadly.

The AutoTuner will provide information about services related to a problem diagnosis as well as nearby part stores and auto shops. This way the user can easily contact a business that may be able to help - be it an auto shop, towing agency, or local insurance company. Because the app uses semi-smart problem diagnosis, it can recognize the occurrence of a specific incident, rather than simply seeing the sudden failure of a number of components. With this, it can gauge the severity of the situation and react appropriately.

AutoTuner has built in support for contacting emergency medical services, similar to onstar. Providing the same peace of mind, but without the associated cost. If AutoTuner sees indicators of an accident, it will attempt to call emergency services. Because each collision incident is different in some way, AutoTuner will automatically enable speakerphone in the event you are unable to pick up the phone.

To further our concept of making AutoTuner an all encompassing automotive assistant, we asked ourselves what else the average automobile owner wants instead of what they need. We answered that question by adding optional support for remote auto-start, lock/unlock, alarm system and remote plug-in as well as notification of running vehicle and lights left on (including the cab lights). If the user chooses to get the remote
features installed, they will need to order AutoTuner Deluxe package which comes with the proper parts and instructions for installation.

1.5 Case Study

We gave 100 people a free AutoTuner Bluetooth Code Interpreter and installed it in their vehicles for them. We attempted to select a varied range of participants that consisted of 32 people excited for the product, 34 neutral on the product, and 34 people skeptical or loyal to another brand. We gave these product testers 2 months with our product to test it out and develop and opinion. During these 2 months the customers put our product through a full range of real world test by getting into accidents, breaking down, using some of our optional features to start or unlock their vehicle. Not a single AutoTuner malfunctioned or stopped working. When asked about their experience with the auto tuner system George S. said, “It has a simple interface, is easy to use, and gets what I want done, accomplished. Another tester Carol P. said, “When I got into my accident I didn’t know what to do. Luckily AutoTuner called EMS, monitored crash data, started determining which parts of the vehicle were damaged, found them, and generated a price list of how I could get the parts the cheapest.” These are just two of the happy people who used AutoTuner during our trial period. Of the original 100, 84 people said that they would continue to use AutoTuner on their own and would recommend it to friends. Of the remaining 12, 4 people said that they would keep using their AutoTuner but not recommend it, and 8 said they were happier with their previous companies product or that AutoTuner did not live up to their standards. This brings AutoTuner’s approval rating to almost 90% out of the people who used it and we would like to think most of you will enjoy it as well.
1.6 Conclusion/Call To Arms

The AutoTuner is nothing short of revolutionary for the industry. We are the only product to offer support for you and your vehicle on so many levels. With the only industry wide Bluetooth connectivity and cell phone based user interface we offer an easier way to monitor your car's well-being. Our patented parts/quote finder will help you get back on your wheels as painlessly and quickly as possible. All of these things coupled with the optional integrated autostart, remote lock/unlock, and remote plug in help bring AutoTuner to the forefront of the industry. This paper discussed just a few of the plans that Exordium Industries plans to implement, to bring a new beginning to this stagnant part of the industry. We plan on establishing ourselves in this market and providing quality personalized customer service to our clients for years to come.

1.7 About the Company

The company Exordium Industries was funded by a Nigerian Prince when the founders, Nate Helms, Nick Mardeusz and Brahm Lower, responded to a request to help the prince move his money out of Nigeria. It only took a small investment from our soon to be company, for tax purposes. Exordium came to be after Nate, Nick, and Brahm were presented with the challenge of creating a group project during a college level ethics class. Their project consisted of an automotive assistant phone application that interprets error codes and diagnostics from a vehicle and a remote auto-start, lock/unlock, etc. After receiving an A on the project, as well as the class, the three decided the project was good enough to merit developing the idea into a real product. Using the funding bestowed upon them by the Nigerian Prince, they developed a prototype for AutoTuner and presented the
project to a number of investors. The investors reacted favorably and decided there was enough value to the concept to make it a successful, real product. The funding followed. The product is on track to be a big success. The company is devoted to continually improving their app to make being an automobile owner a safer, less stressful and more reliable experience for all of AutoTuner's users.