**ECE411 Homework 2 – Project Proposal (Team Assignment)**

1.)Team Members-

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2.) Project Ideas

Project1: Illuminated Traffic Vest

This will be a device that can add more illumination for motorcycle and scooter enthusiast alike. By having an LED powered vest, you are allowing drivers the ability to see more clearly your brake light and turn signals. Vest can either be wired to your motorcycle battery or be powered by 9V battery. It will be easy to install for novice or electrically challenged. We will potentially have an IR transmitter on the bike and receiver on the vest.

Estimated Cost: $200

Project2: HUD for RC aircraft

The heads up display will incorporate the transfer and parsing of signals from a gyrometer and accelerometer over a wireless network or a wired network. Once the information has been processed it will provide a horizontal instrument display that will ultimately provide the orientation of the aircraft that the data is being provided from. Necessary items are; low cost display, gyrometer/accelerometer on chip, microcontroller with display capabilities.

Estimated Cost: $50-$100

Project3: Outline Tracing/Tracking LASER

This device will track the movements of an individual and trace the outline of the individuals figure on a backdrop. A photo-sensor will be used to track the individual’s movements and a microprocessor will be used to guide the laser and trace their outline. A possible extension of this project will be to have the device track a specific individual, possibly with certain distinguishing features or in possession of a certain object, in a larger group.

Estimated Cost: $500

Project4: Noise Detector and a POV

This project can be used in a babies room. The noise detector will turn on the Persistence Of Vision(POV) wheel, which could buy the parents some time to reach the room without the baby getting out of control. The POV wheel will need an engine that can produce a high power for high speed rotation.

Estimated cost: $350

3. Decision matrix and explanation

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| --- | --- | --- | --- | --- | --- |
| **Project** | | **Light Vest** | **RC HUD** | **Tracing LAZER** | **Noise Detector and a POV** |
| **Requirement Satisfaction** | 10 | 9 | 9 | 6 | 8 |
| **Cost** | 6 | 6 | 6 | 3 | 4 |
| **Feasibility** | 8 | 8 | 2 | 3 | 2 |
| **Originality** | 4 | 5 | 4 | 3 | 3 |
| **Usefulness** | 3 | 8 | 5 | 2 | 8 |
| **Score** | | **234** | **149** | **120** | **164** |

Because we decide on the project we are implementing as a group, the requirement satisfaction category will have the highest weight when considering which project we choose. Due to absolutely inflexible time constraints the next highest weighted category will be feasibility. Cost is a major consideration but the range in price throughout our projects does not vary much although like any true Americans we should mostly be concerned about how much money we can make. Originality is highly important to us, but for this project we are limited by the amount of time we have, so its weight in our overall choice will be less. For this project, usefulness can have the lowest weight because this is a beginners’ project for us.

The numerical values assigned for the RC HUD and Tracing LAZER are very low most importantly in the feasibility criteria. That is because of the time frame we are limited in, and the need for wireless implementation. As for the light vest in comparison with the persistence of vision idea we came to the feeling that this would also be an idea that we would not be able to accomplish at this time in our careers because it is beyond our engineering capabilities. We felt that these ideas were all something that we would like to do but in the end had to decide on an option that we would be able to complete in the amount of time that has been provided.

Our final decision is the Light vest that will provide safety to motorcycle riders everywhere, hence the high score in usefulness. The cost of the items is relatively inexpensive and the feasibility has some quirks and difficulties that we will face but nothing that we will find nearly impossible or anything that at least one of our group members hasn’t come across in their academic career. It also satisfies all of the requirements which is the real deal breaker on this item.

Overall we have whittled down these items one by one and have come to the decision that this will be the best project for a group of our varying abilities and doable with the amount of time that we all have in the rest of the term.

4.) Project Proposal-The Illuminated Motorcycle Light Vest

The main idea of this project is to build a prototype, The Illuminated Motorcycle Light Vest, that will insure safety for bikers. The vest will have an LED display which more prominently indicates the actions of the biker than the standard signals on a motorcycle. A microcontroller will be used to control the display, and the microcontroller will receive wirelessly transmitted signals from another circuit which keeps track of the turn and braking signals from the circuitry within the motorcycle.

This project will require that we either obtain indicator signals from within the circuitry of the motorcycle, or install new sensors that allow us to determine which indicators are active. These signals will be processed, encoded, and wirelessly transmitted by a circuit which is installed on the motorcycle. The signals from the circuitry installed on the bike will be received by a wireless device, decoded, and interpreted on the display circuitry. The display, which can either be worn on the safety vest of the biker or be attached to a backpack if required, will be operated by a microcontroller which is mounted near the display. The IR reciever would be attached to the front of the rider, while the IR transmitter would be mounted on the handle bars. This allows for an easier installation for the rider, who potentially could be electrically challenged.

**Needs Statement:**

The device needs that we will require as a group to accomplish this project consist of the following;

* A microcontroller – something that we are familiar with and can afford (possibly an Atmel chipset)
* IR transmitter and receiver – something that is powerful enough to maintain a connection throughout multiple movements and disruptions that may occur while riding a motorcycle.
* A power source - this will be either rechargeable or able to last for long periods of time and be reliable.
* Multiple chips - encoders, decoders, multiplexers, basically something that will be able to control the display after being initiated with the microcontroller after transmission has been received.
* LED display – something that needs to be bright enough to see in the day light.

**Possible existing market:** This would include most motorcycle riders that feel safety is a priority. Speaking with several motorcycle enthusiest, they are all need of high visability at night without adding reflective gear. This one product could be a breakthrough in rider safety, potentially provide a future business opportunity. This could also be adapted for the bicyclist enthusiest everywhere. We could potentially develope a prototype in the future, that would be a three way switch attached to a bicycle who could opperate the turns signals and brakes for night time visability.

**Preliminary schedule:**

Week 3-4: Specifications, prototyping, design

Week 5-6: Manufacturing: Layout, parts and board ordering

Week 7-8: Assembly and testing

Week 9-10: Demonstration and documentation

5.) Site Wiki: [http://www.Power411.wikidot.com](http://www.power411.wikidot.com/)