



Lighted Bicycle Vest

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BACKGROUND

There are over 130,000 [1] accidents involving bicycles a year just in the United States. Over 1,000 of those result in death of the victim. Our product will bring attention to Bicyclist that are trying to share the road. Our goal is to BRIGHTEN their future and prevent the cyclist from having a very bad day while out on their bikes.



Photo Credits: Shutterstock

Why we feel our product is important

We feel like our product is important and revolutionary to the biking community because it has the potential to reduce the number of accidents involving bicycles. Our goal would be to reduce the number of accidents by 25% and even if we can save 1 life or save 1 person from being injured we will consider this product a success!

PROPOSED SOLUTION

We designed a product to reduce the number of accidents involving Bicyclist on the road by putting a High Visibility vest on with the following features

- Running lights
- Turn signals
- brake lights

We plan to achieve this by utilizing a wireless connection between a handlebar mounted controller and a vest the user will wear that has LED lights attached. See figure 2 below.

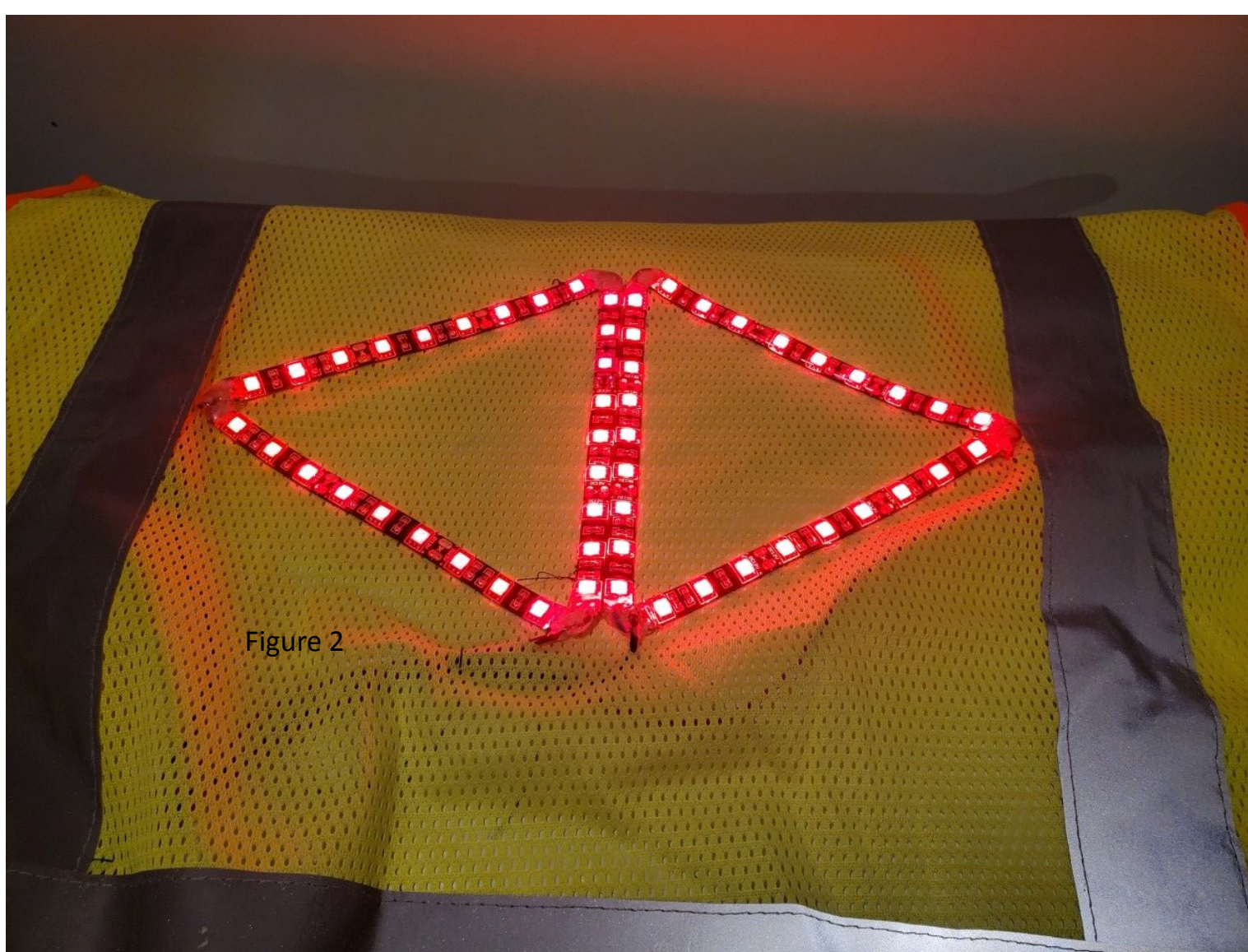


Figure 2

Figure 1

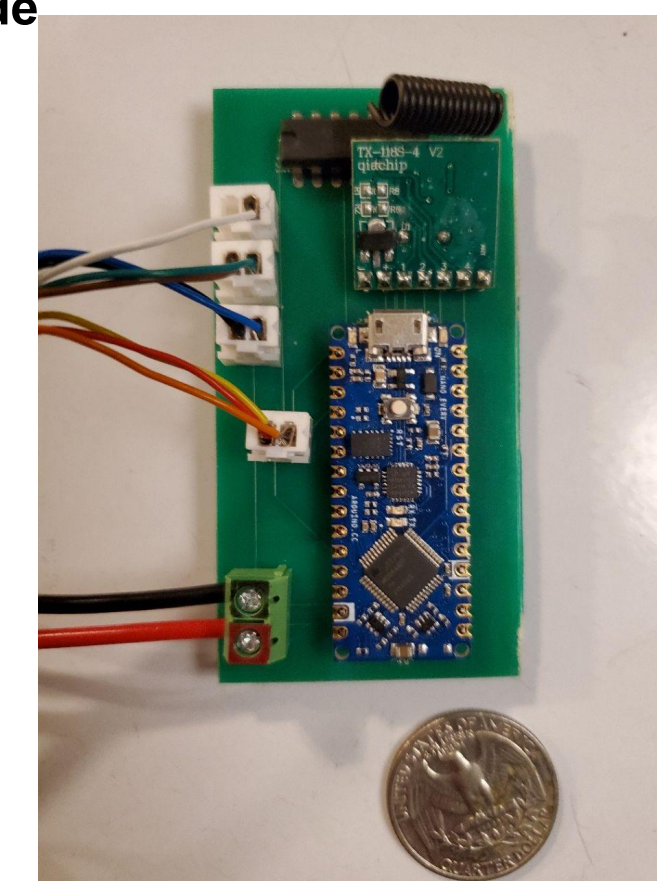
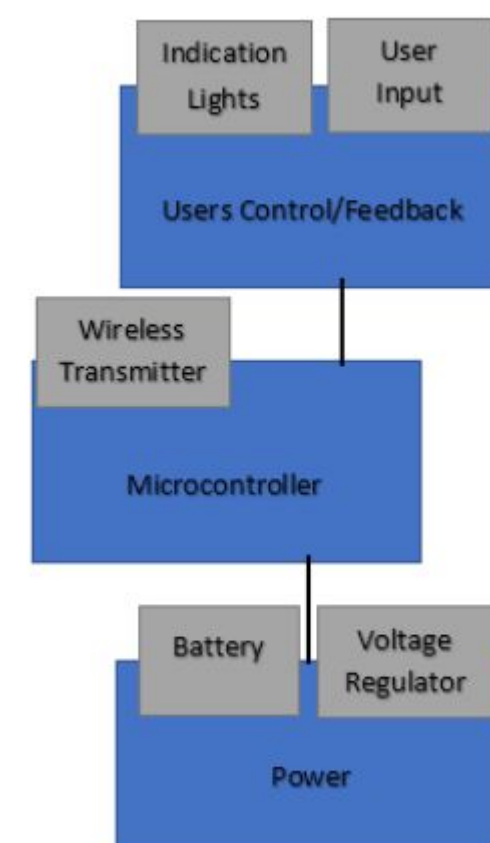
SYSTEM DESIGN

Transmitting Side:

- Mounted to the handlebar of a Bicycle
- The user will see a green marker indicating what way the turn signal is flashing at
- When power is connected and the transmitter side is powered up and ready the blue indicator will turn on



Figure 4 Transmitter side



Arduino Processor

Arduino Nano provides a flexible source hardware configuration. Its open software, and widespread availability, and compact size make it an ideal microprocessor to fulfill our requirements.



Power Management

- Milwaukee M12 battery 1.5 Amp hour to power the receiving side, will last 2 hours on a single charge at maximum power output.
- 9V battery to power transmitting side will last for 30 hours of use

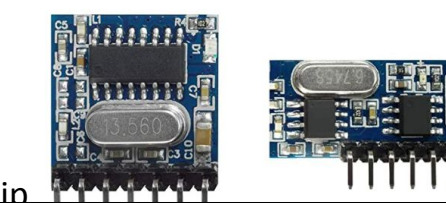


Photo Credit Milwaukee Tools

Transmitter and Receiver technical specs:

- 433 Mhz RF signal
- Larger the antenna the longer the range
- 4 Bit processing capability
- Paired so when power is disconnected it will automatically pair with the receiver

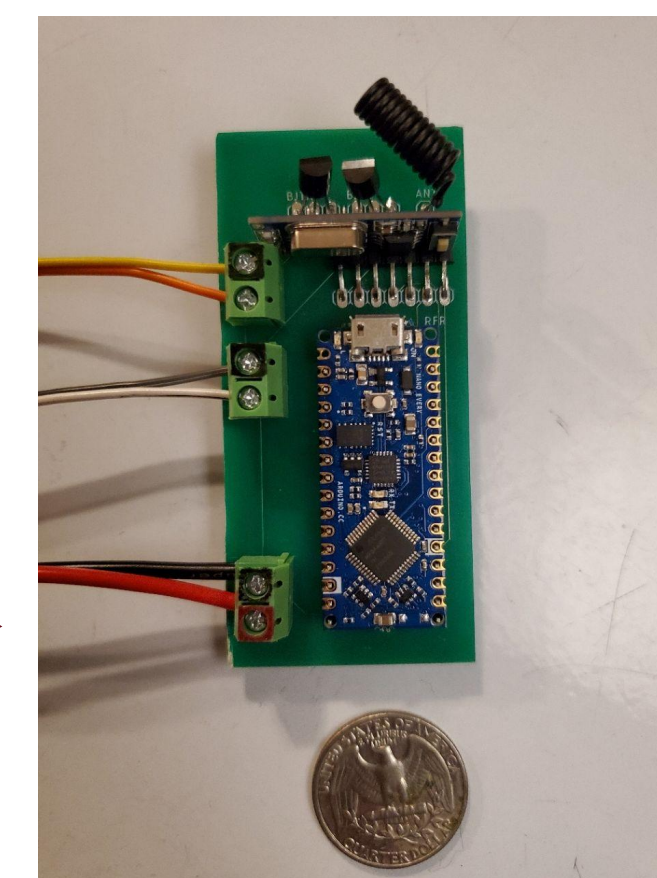
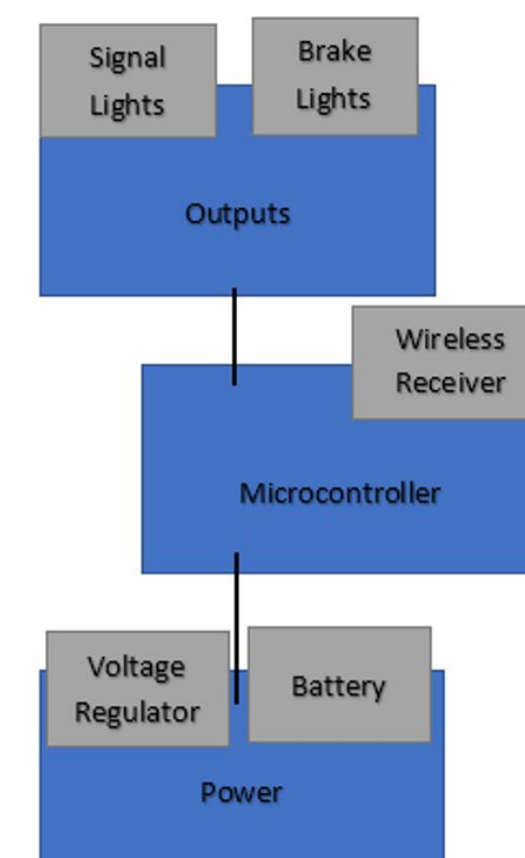
Photo Credits Qiachip



Light Brightness

- Utilize PWM to adjust brightness strength
Breaking= 80%
Running lights =50%
Turn Signal= 100%

Figure 5 Receiver side



FUTURE DIRECTION

- Add a headlights so the user can see when it is dark.
- explore increasing battery capacity while keeping weight low.
- Remove the Arduino base so we can manufacture and sell this product.
- Apply for a patent.

REFERENCES

[1] CDC 2021

ACKNOWLEDGEMENTS

We would like to thank Electrical Engineering department at Mankato State University for allowing us to pursue this project. As well as our Senior Design professor, Dr. P. Hamari for all the support along the way and providing exceptional support.

CONTACT INFORMATION

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