

SMART GLASS-DESCRIPTION

Project proposal

Trying to build a cheap Arduino Data Glasses for everybody. It's working, and now it can even help to avoid accidents. From the first idea to the working prototype, it took 2 Months. The challenge was, that It should be constructed out of common materials that can be found easily.

The project is more about how to build the optical system for this HMD. I have a few ideas and one of them is to connect it to a Multimeter over Bluetooth to get the Data right in front of my eyes.

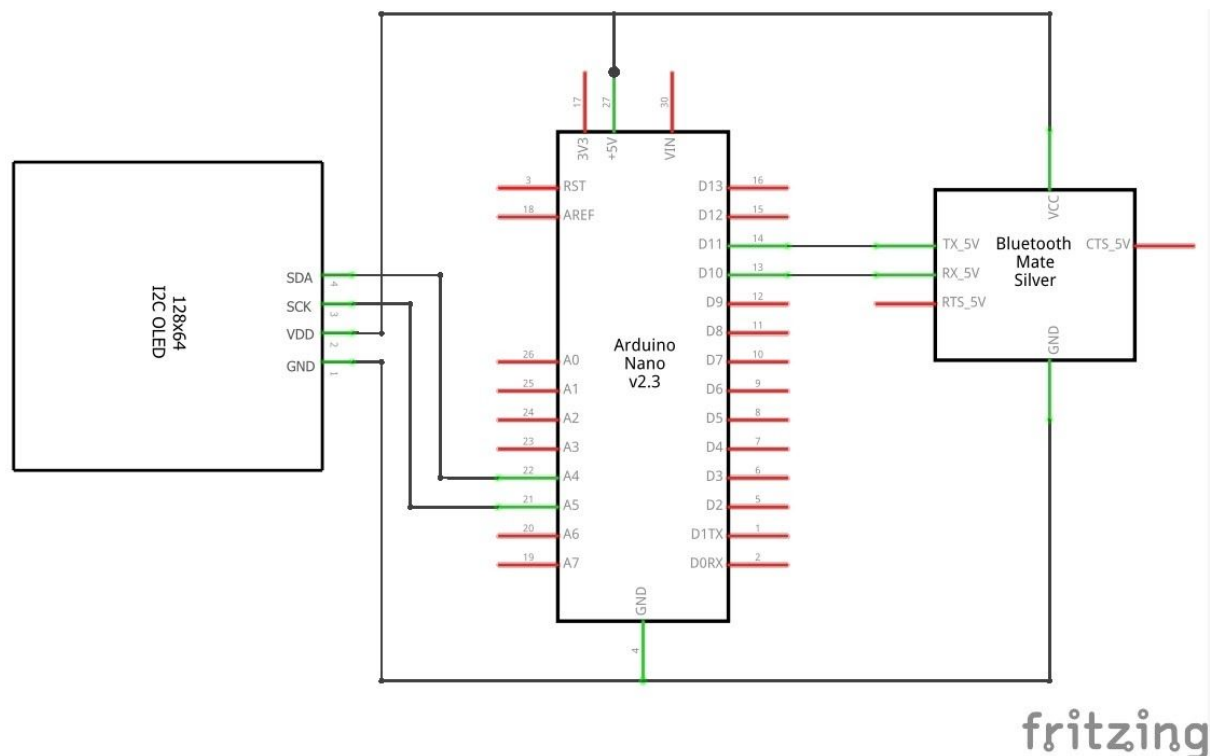
One thing is clear, you can not just place a screen in front of your eyes, because it will not be possible for them to focus it. In the logs you can see from the first tests to what I have now. The whole project runs under Open Source License.

Measurement of lens

The lens was a tricky thing. We had not really an Idea about optics. So I googled and googled, and we learned a lot about real images, virtual images focal points, and magnification. The best working lens is an Acrylic Plano convex lens with a focal point of 100mm. If you place the screen at a distance of 73mm from the lens away, you will get a virtual image at a distance between 27 - 30 cm. The magnification factor is x3 That's perfect, because another important thing is, that your eyes can only start focusing things at +-25 cm

For the first tests I used an enclosure made with cardboard. This was a cheap solution and worked very well. For the final version, I used my 3D printer. The style file has been created in 123 design. I need to make a few modifications to the design, but it's not bad for the first try.

Schematic diagram for bluetooth with arduino nano and oled display

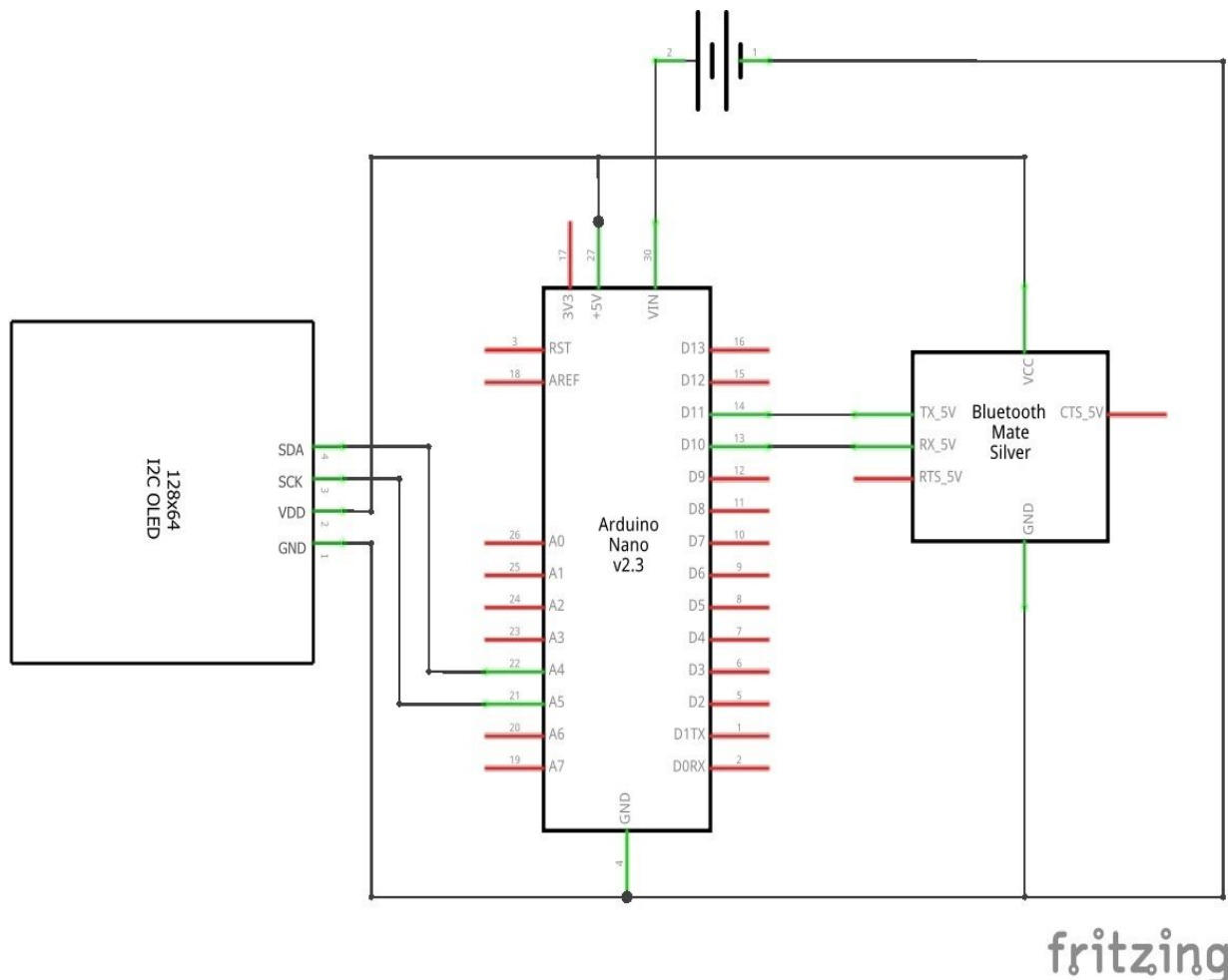


We finally printed out the covers for the enclosure. The mirror and the lens are mounted with all the electronics. All fits in, and it works great. This one has a lens with a focal point of 100mm.

Data glasses are composed of complex, precisely positioned optical components – among others sensors and mirrors, the glasses are particularly useful for industrial

workers who require regular, real-time information but need to keep their hands free for working.

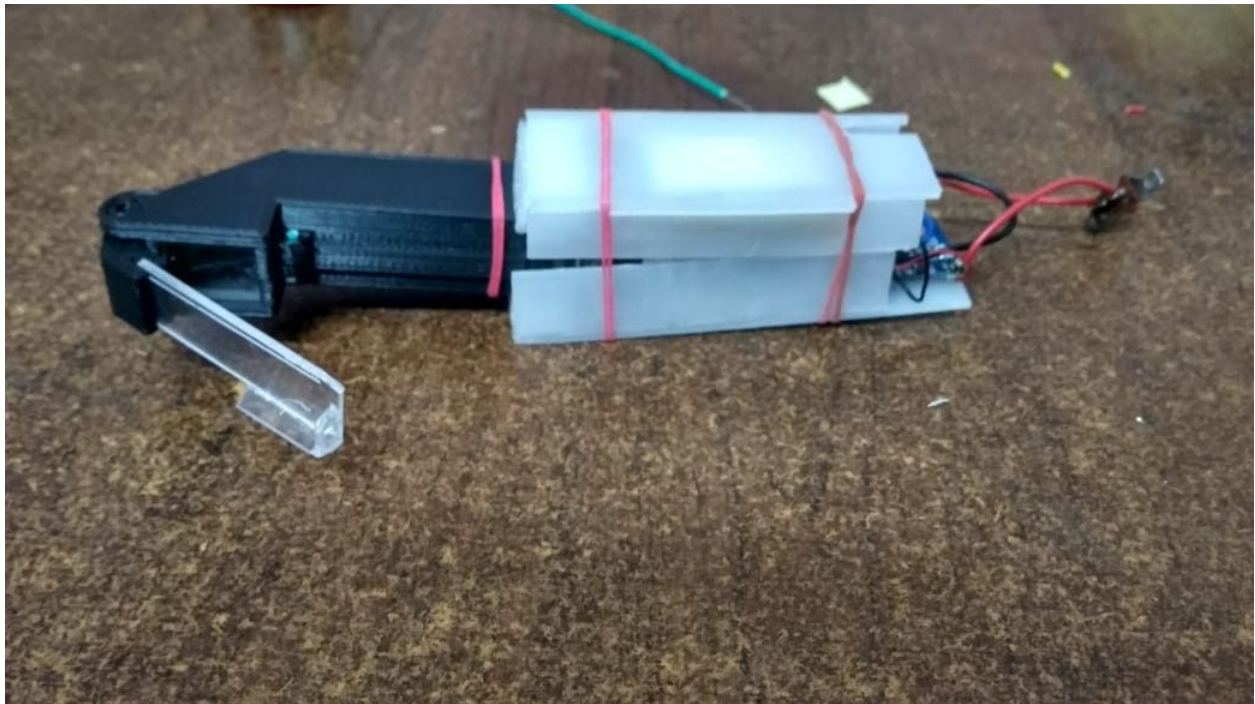
These glasses are not a new concept; Google glass was a high-profile experiment and failure. What's new about Data Glasses is that they're a slimmed down, 3D printed, and standardized version of the technology. Herold is making the glasses easier to wear, whether over a helmet or directly on your head.



Challenges

Facing a defining moment, smart glasses companies are fighting hard to maintain and expand their ground. Even though businesses are finding great workflow solutions through eyewear technology, the general public will still have to wait a little longer to reap the benefits of mass-accessibility and usage.

However, be not mistaken, the promising general public consumer sector is not being neglected. Quite the contrary.



The above prototype model is the first worked out model of our project.



Top view and front view image of our project.

REFERENCES

1. **U.S. Track Cycling Team Training for Rio Olympics with Smart Sunglasses-shades with display performances wearables. Big data analytics, and implanted devices that enable new ventures in personalized medicine.**
2. **Differing from the 100% immersive virtual reality headsets, smart glasses give users a sense of both physical and digital worlds simultaneously, providing a much more natural experience. This is done through either an Optical Head-Mounted Display (OHMD), Augmented Reality (AR) technology, or through Heads Up Display Glasses (HUD).**

USE CASES

1. **The most prominent application for smart glasses today is most definitely video collaboration. The ability to work together with experts remotely in a see-what-I-see system is improving many sectors across the board.**
2. **Smart glasses are also substituting handheld devices, scanners and paper and as a result employees are increasing productivity while decreasing errors and subsequent costs.**
3. **By using smart glasses (or smart hard hats) construction workers experience a safer, more productive hands-free workflow.**

