Villanova University

Optical Zoom Glasses

Proposal

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Project Definition

Background - Optical Zoom Glasses serve a variety of purposes such as enhancing the human vision by allowing the user to zoom in further than their naked eyes ever possibly could, and also protecting the eye from everyday strain [2]. Our motivation stemmed from this second purpose. We at Perceive strongly disliked the fact that your eyes would get tired and sore from having to squint to either read small text or view something far away. This cumbersome problem is a part of many people's daily lives whether it is at work or during any of their daily activities. Consequently, we decided to create a solution to this daily annoyance. With the help of inspiration from eyeglass professionals and binocular manufacturers, we combined the two products into one amazing pair of eyeglasses meant for everyday use.

Objectives - Our goal at Perceive with the product Optical Zoom Glasses is to totally reinvent the eyeglasses industry. We wanted to take all of the aspects from the current market, but add one key feature that will change lives across the world. We wanted to create a feature that would take away the need to squint or strain your eyes. By doing so, people will have healthier eyesight later into their lives, will never have to feel like their eyes are tired and need a rest, and will also benefit from increased vision range. In summary, our goal was to change the way the world sees by making these glasses accessible to everyone globally.

Specifications/Constraints - One of our main focuses was to make these glasses widely accessible. This added a few constraints to our designs, because if the glasses were too expensive to produce, then our product wouldn’t be able to help as many people because they can’t afford

it. We decided to fix this issue by releasing a line of products varying in price. There is the base model, the Perceive X, which is affordable enough to where it will be in the price range of the majority of eyeglass consumers. Then we have two higher end models: the Perceive XE and the Perceive Plus. These two models allow consumers who are interested additional features such as digitization, color shifting, and the ability to switch to microscope mode. The price constraints brought along specifications of materials we could use for the Perceive X specifically, because we wanted it to be as affordable as possible. To combat this we have lined up collaborations with multiple eyeglass frame manufacturers, both high end and affordable, to create an even larger variety in pricing. This will allow us to reach the maximum number of people with our Optical Zoom Glasses.

Methodology

Feasibility Analysis - Achieving an ability to accomplish optical/digital zoom without sacrificing design and size in eyewear can be done in several different ways. The first method is accomplished using a novel nano-optical fiber material. This structured material allows for the magnification of light without the need for a large lens. This method uses embedded magnetic particles entrapped in the structure to allow for the rotation of the molecular structure; in turn allowing for the ability to change the zoom distance of the lens. Because of the unique and state-of-the-art material, this method is currently achievable, albeit in very limited production under controlled conditions. These two issues can be overcome with the further development of our material and with the long-term economy of scale.

The other method utilizes available technology to achieve zoomed images. Unlike the previous method, the second method involves using a digital camera built into the frame to zoom. In order to display this zoomed image, transparent organic light emitting devices, or TOLED displays are incorporated into the lens of the glasses. This method, commonly known as "Augmented Reality" would add the benefit of being able to display a number of other things in the users FOV (field of view) such as texts, images, and information about things around them. These added features would be useful, and would serve as additional selling points but would result in an added complexity of the system. This method is possible today, especially with the further development of Transparent OLED technology. However, due to the reliance on electronics a number of other issues and complexities arise. Computational power, and more importantly power, need to be fit into the structure of the glasses without affecting the look or comfort of the frames.

Proposed Approach - The approach intended to be used is the nano-optical structured material. This method allows for the goal of the product to be reached passively. No external device or power is required. This allows the lenses to be worn exactly like traditional lenses with the added benefit of a zoom ability. This technology is much more flexible and allows for the ability to incorporate the lens into prescription lenses as well as polarized or tinted lenses. It also allows for the future collaboration with other glass frame producers, in which our lens can be put into name brand and designer branded frames.

This approach is heavily dependent on the innovative nano-optical material. Similarly to traditional lenses, our material is able to bend and modify the properties of incoming light. Alone, this does not accomplish much. However, upon the layering of several of these materials,

optical zoom is able to be achieved without sacrificing clarity of the image. This is achieved by arranging chemically pure quartz molecules in a prismatic structure arranged in a very specific pattern. At the vertex of each prism is a single alnico alloy molecule. This alloy, which has magnetic properties stronger than any other known material [1], allows for an external magnetic field to be applied, which physically alters the structure of the quartz material, thus re-focusing the light.

Non-technical Aspects - Because the product alters vision, an incredibly important and essential aspect in many daily activities, there are a number of different things that need to be considered before bringing this product to market. As with all eyewear currently on the market, the purpose of this product is to improve vision not impair it. Because the dynamic zoom capabilities are based on the magnetic platform, it is important that it is unaffected by external sources that could cause unwanted zooming, or focusing of the lens. It is also important to further explore the lifespan of this technology and identify weaknesses that can coccure over time.

Administration

Corporate structure -For this product, our company's various departments will cooperate to complete an efficient design, production, and publicity. We have a very experienced product manager who is responsible for summarizing and monitoring the entire product line and the daily progress of the various departments. They are responsible for business cases, conceptualization, planning, product development, product marketing, and delivering products to target markets.

After most of the research is done by our technology department, our Marketing Department analyzes the information, including customer research, competitive intelligence, industry analysis, trends, economic signals and competitive activity, and records demand. After product managers accept and analyze this information, they develop a product strategy and create a roadmap. Product managers align with various departments within the company, including product design and development, marketing, sales, customer support, and legal. Efficient cooperation and clear division of labor has always been our right-hand man on the way to success.

Publicity-The Marketing Department will investigate the basic properties, product features and product highlights of glasses and experience the products through personnel from various aspects, so as to achieve product satisfaction. Have a clear understanding of the basic information of the target audience, including age, geographical distribution, preferences, etc. The audience target is classified into core audience target, sub-core audience target and pan-target audience. After a clear understanding of the basic information of the target audience, we will carry out key marketing at the key time and during the launch of the product, including star delivery, web advertising and marketing hot events.

We also have one of the best sales departments in the industry. In the past ten years, our products have gained a lot of loyal users around the world. After the launch of our products, we will also carry out point-to-point promotion to some large enterprises and companies, even the US military. Under the orders of these large enterprises, it can also play a leading role in making ordinary people to our products

Co-brand product-Our technology in lenses is superb and ahead of the industry, which undoubtedly brings us a lot of benefits, one of which is to cooperate with other well-known brands to sell products. We will use the fashionable frames of these brands to sell our lenses jointly, which will have several benefits. Cooperation with some of the luxury brands can pull up the image of our company within the general public. Secondly, cooperation with fashion brands can pave the way for the company to sell accessories and other peripheral products in the future. Now, several famous companies have expressed interest in our products, and we are also actively discussing the way of product cooperation. With no doubt, Our glasses will become a trend in the next ten years

Sources :
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