LANTRONIX®

INDUSTRY:
Medical & Healthcare
Lantronix Contributes to eSight Design

Case Study Overview:

To enable individuals with serious visual impairment to see, including some for the very first time, eSight created its enhanced vision device. To make its revolutionary innovation a reality, eSight relied on Lantronix Engineering Services to develop the camera, image processing and high-definition screens and to customize the Qualcomm® APQ8084 application processor to enable the processing power. Together, these technologies increase the information that gets to the eyes, empowering individuals with low vision and legal blindness to see.

Empowering Individuals with Visual Impairment to See

To fully empower individuals living with more than 20 different eye conditions including macular degeneration, diabetic retinopathy and Stargardt's disease, eSight created a wearable device that offers 100 percent mobility retention and best visual acuity. The device captures live footage from a camera over the user's nose, enhance the stream and project it onto small, high-definition screens just centimeters away from the eyes. The result is a nearly real-time image of what is in front of the wearer, making it much easier to see small or faraway details.

Challenge: Utilize Camera Technology to Create eSight

The eSight team turned to Lantronix to tackle a big design challenge: utilize camera technology to create an enhanced vision device that would be functional and comfortable for users.

Challenges included:

- Integrating cameras, image processing and high-definition screens into a wearable device
- Ensuring functional operation in real-life user environments, including peripheral views
- Enabling wireless connectivity to allow the device to take photos and stream content
- Implementing technologies with the necessary on-device processing power
- Product affordability both for the design and retail price for users

> " Utilizing the Lantronix engineering team's skills, knowledge and technology, we were able to create a wearable device that enables people with legal blindness to see again – some for the very first time. "
>
> – Charles Lim, Chief Technology Officer, eSight Corp.

Product:
Lantronix Engineering Services

Lantronix Engineering Services offers a full range of production-ready Edge AI computing solutions, including multi-disciplinary services. Its experienced engineering team provides IoT product development that delivers unparalleled expertise and proven product development best practices. From fixed-cost turnkey product development to augmenting design teams on complex projects, the Lantronix Engineering Services team helps its customers meet their technical goals and quickly get products to prototype and market.

For more information, visit: https://www.lantronix.com/professional-services/

Solution: Lantronix Customization and Integration Services

With the goal of making the eSight device affordable for users, Lantronix's high-performance, low-latency custom solution for eSight featured a highly technical design that integrates custom circuit boards and software to take advantage of the power of the Qualcomm APQ8084 application processor. The design also included cameras, OLED displays, sensors, touchpad, Wi-Fi®, Bluetooth, USB, audio, battery charging and device management. Software development included camera focusing technologies, security and driver support.

Results: eSight Enables Wearers to See

A typical eSight wearer has visual acuity of 20/60-20/800. Wearing eSight and looking at the live footage it captures, many achieve 20/20. Advanced algorithms optimize and enhance images before showing them on two screens in front of the eyes. Delivering more data to the brain creates an increased reaction from the eyes that enables the user to see faces, read and live a much more normal life.

As a bonus, unlike other assistive devices, eSight also allow users to take photos and stream content directly to the eSight screens and extend a shared account to loved ones so they can see what they see and help customize their experience. Together, eSight Corp and Lantronix took advantage of the Android™ 7.0 smartphone-caliber processor to create the most valuable features of the eSight device:

- High-speed, high-definition (18 megapixel) camera with liquid lens and 24x zoom, contrast, focus, color settings and biopic tilt for peripheral vision
- Two high-resolution, OLED screens for full binocular vision
- Sensors for detecting distance, temperature and orientation
- Advanced UI with HDMI, Wi-Fi and Bluetooth that allow the user to take photos, stream content and get automatic updates

Benefits of Using Lantronix Include:

- Single-vendor engineering solutions
- Affordable development cycle
- Ability to customize Qualcomm APQ8084
- Speed to production and market
- Delivery of a certified solution to market

> **"** **Bringing sight to people is an incredible accomplishment. We are honored to support eSight in creating a wearable device that harnesses the power of technology to change lives. "**
>
> – Victor Gonzalez, Senior Director, Engineering

About eSight Eyewear

eSight is a leading vision-platform organization with a simple but profound promise: empower individuals with sight loss to see new possibilities through enhanced vision. eSight provides the most advanced and versatile assistive device available for those with visual impairments and is compatible with more than 20 eye conditions including macular degeneration, diabetic retinopathy, and Stargardt disease. eSight is registered with the FDA and EUDAMED and is inspected by Health Canada. Learn more at www.eSightEyewear.com.

How eSight Works

Using cameras, image processing and high-definition screens, eSight delivers more data through the eyes to the brain, triggering an increased reaction from the eye, which enables people with challenging vision issues to do see and do more things with greater ease and clarity. A small, handheld remote control is used to power on the device and adjust the settings. Wearers can use the remote control for adjusting contrast, focus and color settings as well as zoom with up to 24x magnification.

About Lantronix

Lantronix Inc. is a global provider of Software as a Service (SaaS), connectivity services, engineering services, intelligent hardware and turnkey solutions for the Internet of Things (IoT) and Remote Environment Management (REM). Lantronix enables its customers to provide reliable and secure solutions while accelerating their time to market. Lantronix's products and services dramatically simplify operations through the creation, development, deployment and management of customer projects at scale while providing quality, reliability and security.

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