

Microsoft Cognitive Services

Wearable technology firm is helping people who are visually impaired “see” the world

“One of our software engineers with no machine-learning or computer-vision experience was able to alter the device software to work with the Microsoft Cognitive Services APIs in a very short time.”

—Benoit Chirouter, R&D Director, Pivothead

Pivothead makes wearable technology that looks like regular eyewear, but allows customers to shoot high-definition video, capture still images, and stream personal POV experiences live. Using Microsoft Cognitive Services APIs, Pivothead is working on a project for people with impaired vision, which incorporates software that translates images and text to speech, and provides detailed descriptions that help them “see” the world in front of them.

pivothead 

Pivothead

www.pivothead.com

25 employees

United States

Wearable technology

Company profile

Founded in 2010, Pivothead is a privately funded company specializing in wearable technology that enables customers to create and communicate high-quality, real-time point-of-view (POV) content.

“Using the Cognitive Services APIs, it took us three months to develop a test pair of glasses that can translate text and images into speech, identify emotions, and describe scenery. If we had been working full time, we could have done it in two weeks.”

—Benoit Chirouter, R&D Director,
Pivothead

Finding a new vision for wearable technology

Pivothead is a pioneer in wearable technology that combines eyeglasses with high-quality still and video cameras to allow people to create vivid point-of-view (POV) content and share what they see. Founded in 2010, the company now has 25 employees in three offices—Denver, Taipei, and Shanghai—and a current customer mix of about 70 percent consumer and 30 percent corporate.

Customers in more than 60 countries have purchased approximately 50,000 Pivothead wearable technology devices over the past four years. In addition to consumers, Pivothead customers include leading companies such as Intel, Airbus, and GE, and top universities and research facilities such as UCLA Children’s Hospital of Los Angeles, Bern University of Applied Sciences, and the University of St. Andrews. Pivothead is also working with Fortune 500 companies to build enterprise-specific capabilities for smart automation, SIP-based VoIP two-way POV communication, and mobile device management.

Yet, despite the company’s growing success, there was one challenge its researchers and engineers had never been able to overcome—creating a device that would provide a semblance of sight for people who are blind or visually impaired.

“For years, we had been working with university researchers on ideas for how we could use our eyeglasses to support people with impaired vision,” says Benoit Chirouter, R&D Director at Pivothead. “But we were never able to achieve a breakthrough until we got in touch with the team at Microsoft Research and learned about the Microsoft Cognitive Services APIs.”

Interpreting the world for people who are blind or visually impaired

Microsoft has developed more than 20 intelligence APIs as part of the Cognitive Services collection, and more are on the way. Pivothead chose five: Computer Vision, Emotion, Face, Speech, and Language Understanding Intelligent Service. Using those APIs in a prototype, Pivothead is building a smart device that looks like an ordinary pair of eyeglasses, but actually offers people who are visually impaired a window into the sighted world.

While wearing the glasses, a person who is visually impaired only has to slide her finger along the earpiece to capture an image of whatever is in front of her. If she takes a photo of a person, for example, the device will translate the image to speech and describe what the person is doing, whether they are male or female, what they look like, their approximate age, and what emotion they appear to be expressing at that moment. If the woman takes a photo of text—anything from a restaurant menu to a prescription drug label—the device will read it back in one of several languages, such as English, German, or French.

Pivothead is building the new device on a Linux operating system. Chirouter says the company is also testing it with Android and iOS. “The device uses HTTP code and is platform and operating-system agnostic,” he says. “You can call the APIs from any platform.”

According to Chirouter, one of the most remarkable things about the project is how easy it is to achieve such complex functionality using the Microsoft APIs—and with no need for a data scientist or a computer-vision expert. “Using the Cognitive Services APIs, it took us three months to develop a test pair of glasses that can translate text and images into speech, identify emotions, and describe scenery,” he says. “If we had been working full time, we could have done it in two weeks. That is so incredible.”

“Working with Microsoft has helped us in our goal of supporting people with vision impairments while also opening a whole new market for our products.”

—Benoit Chirouter, R&D Manager,
Pivothead

“If we had been asked at beginning of the project to develop an application that could read text, interpret images, recognize colors, and do all of these other things, I would have said we couldn’t do it,” Chirouter says. “We would have had to engage too many computer-vision experts. It would not have been possible. But one of our software engineers, with no machine-learning or computer-vision experience, was able to alter the device software to work with the Microsoft Cognitive Services APIs in a very short time. The Microsoft Cognitive Services APIs, which use the deep artificial intelligence developed by Microsoft, made that possible.”

Expanding the business, opening new markets

Chirouter says the APIs from Microsoft Cognitive Services are creating new opportunities for Pivothead and its products. He points out that the difficulty of developing applications that can recognize faces, emotions, and objects, and the knowledge required to even attempt such projects, is a barrier to entry for many wearables.

“Machine learning is an interesting field, but very complicated,” he says. “If you are developing a product with barcode recognition, that’s pretty simple. If you’re starting from scratch and trying to develop a product like ours, with all of these remarkable capabilities, that’s almost impossible for most companies.”

“The potential of this is huge,” Chirouter says. “Using the Microsoft APIs, people can develop very complex and specific capabilities with just a few lines of code. Before we discovered these APIs, we were not able to make our smart eyewear for people who are blind or visually impaired, as the deep AI behind it is too complex. Working with Microsoft has helped us in our goal of supporting people with vision impairments while also opening a whole new market for our products.”

For more information

For more information about Microsoft products and services, call the Microsoft Sales Information Center at (800) 426-9400. In Canada, call the Microsoft Canada Information Centre at (877) 568-2495. Customers in the United States who are deaf or hard-of-hearing can reach Microsoft text telephone (TTY/TDD) services at (800) 892-5234. Outside the 50 United States and Canada, please contact your local Microsoft subsidiary.

To access information using the World Wide Web, go to:

www.microsoft.com

Software and services

Microsoft Cognitive Services

Cognitive Services

Microsoft Cognitive Services REST APIs enable developers to tap into high-quality vision, speech, language, and knowledge technologies, developed with decades of Microsoft research to build intelligent apps. They simplify a variety of AI-based tasks, giving you a quick way to add top-of-the-line intelligence technologies to your apps with just a few lines of code. Simply drop the API call into your app’s code and you’re set.

These APIs integrate into whatever language you prefer, on your platform of choice. Your iOS, Android, and Windows apps will have a consistent user experience. The APIs are constantly improving, learning, and getting smarter, so experiences are always up to date. Documentation, sample code, and community support are available for all Cognitive Services APIs.