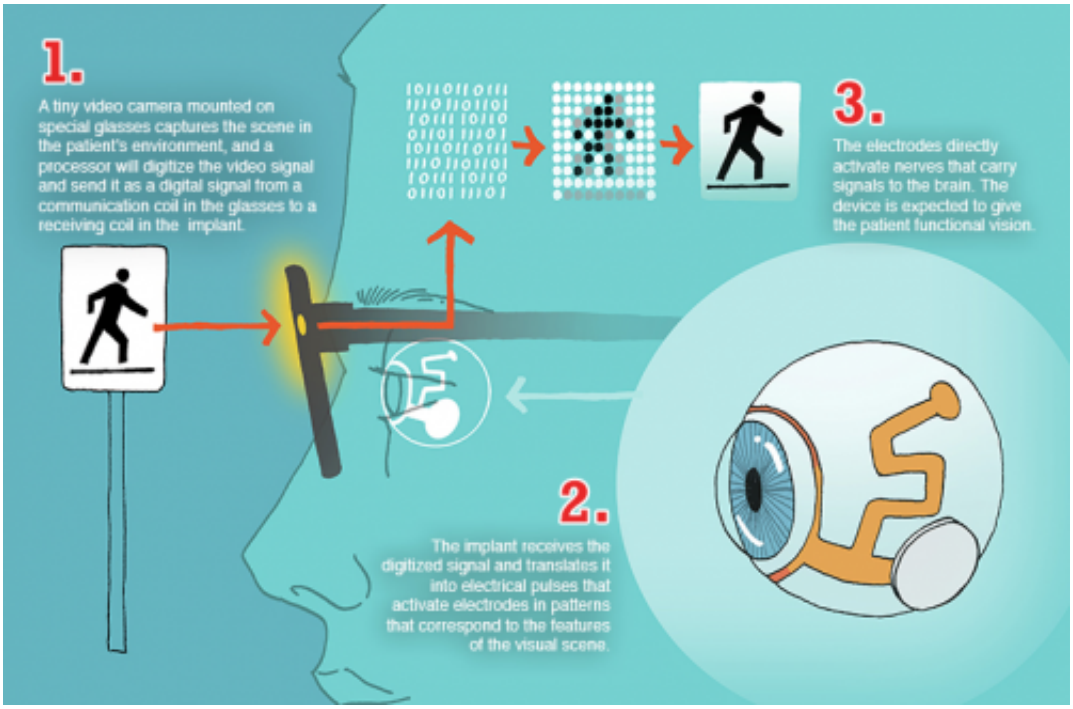
Researcher advances retinal implant that could restore sight for the blind

November 15 2013, by James Hellegaard



People who went blind as a result of certain diseases or injuries may have renewed hope of seeing again thanks to a retinal implant developed with the help of FIU's W. Kinzy Jones, a professor and researcher in the College of Engineering and Computing.

A tiny video camera mounted on special glasses captures the scene in the

patient's environment, and a pocket controller relays the captured video signal to the implant. Inspired by cochlear implants that can restore hearing to some deaf people, the retinal implant works by electrically stimulating nerve cells that normally carry visual input from the retina to the brain, and bypassing the lost retinal cells.

The Boston Retinal Implant Project, a highly-specialized, academically-based team of 30 researchers including Jones, was responsible for bringing the implant to light. The group is comprised of biologists and engineers from Harvard, Cornell, Massachusetts Institute of Technology (MIT) and others who are developing new technologies for the blind.

"Jones' work was one the most important technological developments needed to make the device possible," said Douglas Shire, engineering manager for the Boston Retinal Implant Project. "As a result, users of the retinal implant will be able to adjust the implant according to their needs."

Jones has been working for years to advance the airtight sealed titanium housing and feed-through component that transfers the signals from the implanted microchip to the electrodes. His improvements in the density of that feed-through will greatly improve the quality of the image the person wearing the device will see.

The retinal implant was designed for people who lost vision due to injury to the eyes; progressive vision loss caused by eye disorders (also known as retinitis pigmentosa); or age-related macular degeneration, when the center of the retina that is responsible for central vision deteriorates. According to the National Institutes of Health, age-related macular degeneration is a leading cause of vision loss in Americans 60 years old and older.

"The impact of this technology, which increases the available pixels that

can be stimulated, will bring enhanced visual acuity to people with debilitating eye loss," Jones said. "My mother had macular degeneration and I saw the quality of her life degrade as the disease progressed. Hopefully, when these devices are available for FDA approved use, total loss of eye sight from macular degeneration or retinitis pigmentosa will be a thing of the past within 10 to 15 years."

Recently, a similar device that features 60 electrodes was approved for use in patients and has proven successful in allowing people who were blind to read words on a screen.

Shire explained that the device that the Boston Group is building with Jones' help has more than 256 electrodes and therefore allows for images with a larger number of pixels, which is expected to give patients a meaningful visual experience.

Provided by Florida International University