

Researcher: Cell phones could double as night vision devices

May 4 2010, by Aaron Hoover

(PhysOrg.com) -- Call it Nitelite: The newest app for cell phones might be night vision.

A University of Florida engineering researcher has crafted a nickel-sized imaging device that uses organic light-emitting diode technology similar to that found in [cell phone](#) or laptop screens for night vision. But unlike night vision goggles, which are heavy and expensive, the device is paper-thin, light and inexpensive, making it a possible add-on to cell phone cameras, even eyeglasses, once it is enlarged.

"Really, this is a very inexpensive device," said Franky So, a UF professor of materials science and engineering. "Incorporating it into a cell phone might not be a big deal."

So is the lead author of a paper about the infrared-to-vision device that appeared in a recent issue of the journal [Advanced Materials](#). Do Young Kim, a postdoctoral associate in materials science and engineering, co-authored the paper and collaborated with So on the project.

Standard night vision goggles use a photocathode to convert invisible infrared light [photons](#) into [electrons](#). The electrons are accelerated under high voltage and driven into a phosphorous screen, producing greenish images of objects not visible to the eye in darkness. The process requires thousands of volts and a cathode ray tube-like vacuum tube made of thick glass. That is why the goggles tend to be bulky and heavy.

So's imaging device replaces the [vacuum tube](#) with several layers of organic semiconductor thin film materials. The structure is simple: It consists of a [photodetector](#) connected in series with an LED. When operating, infrared light photons are converted into electrons in the photodetector, and these photo-generated electrons are injected into the LED, generating visible [light](#). The device - versions range from millimeter- to nickel-size -- currently uses glass, but it could be made with plastics, which would make it lightweight.

Conventional night vision goggles or scopes weigh 1 to 2 pounds, with price tags ranging from hundreds to thousands of dollars. Sized for cell phones, So said, his imaging devices weigh just a couple of ounces and would be inexpensive to manufacture because factories could use the same equipment used today to make laptop screens or flat-screen televisions.

So said other applications could include night vision technology for car windshields, or even for standard glasses to use at night.

Provided by University of Florida

Citation: Researcher: Cell phones could double as night vision devices (2010, May 4) retrieved 19 June 2024 from <https://phys.org/news/2010-05-cell-night-vision-devices.html>

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