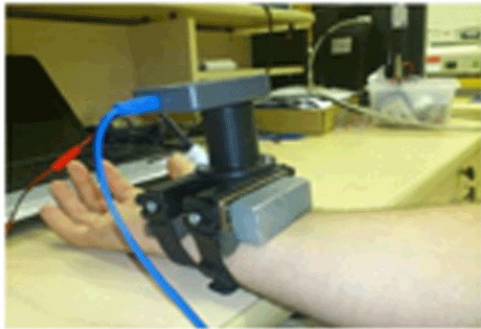


Novel Watch-Like Devices Measure Glucose Level and Pulse Noninvasively

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The new glucose monitoring "watch," Source: Biomedical Optics Express

Dutch and Israeli researchers have developed two wearable watch-like devices to measure body functions such as pulse or glucose levels using optical technology.

Both research projects utilize the so-called "speckle effect." The device directs a laser to the artery on the wrist and measures the backscattered light. Because the reflecting material changes with the bloodstream, the device can analyse alterations in the speckle pattern.

Researchers from the [Israeli Bar-Ilan University](#) attached a magnet to the device that generates a magnetic field. The magnetic field has the effect that the glucose molecules, unlike other chemical compounds, alter the wavefront of the laser, allowing the device to noninvasively measure the glucose concentration.

"Around 96 percent of our in vivo measurements were within a range of 15 percent deviation from the readout of a medical reference glucometer device," said Zeev Zalevsky, one of the researchers. "The main factor for errors now is the stability of our device on the wrist of the user. We are currently investing efforts in deriving proper calibration and motion cancellation procedures that will allow us to reduce this sensitivity."

Researchers from [Delft University of Technology](#), on the other hand, developed a device that analyses speckle patterns in order to measure the wearer's pulse. The advantage, according to the researchers, is that it is less prone to error when the user is in motion.

The findings of both projects were published in the journal [Biomedical Optics Express](#).

By [Thomas Klein](#), Managing Editor, EMDT