



Personalization
login | register



News Archive [link] Web Wikipedia Medical Dictionary [link]

Search

powered by Google™

Follow us on:
twitter™
facebook

Medical Devices / Diagnostics News

Useful Links

Tiny Camera With Adjustable Zoom Could Aid Endoscopic Imaging, Robotics, Night Vision

Main Category: [Medical Devices / Diagnostics](#)
Article Date: 18 Jan 2011 - 3:00 PST

7

email to a friend printer friendly opinions

Researchers from Northwestern University and the University of Illinois at Urbana-Champaign are the first to develop a curvilinear camera, much like the human eye, with the significant feature of a zoom capability, unlike the human eye.

Ads by Google

[OEM Sensing Solutions](#) - Miniature spectrometers & sensors for embedding into medical devices - www.oceanoem.com

[Canon Cameras Sold \\$33.33](#) - Today Only: Canon Digital Cameras Sold For Up to 98% Off. Bid Now! - Canon.Wavee.com

[Med Device Sales Training](#) - Build your own training with our proven medical device programs - www.saleshorizons.com

The "eyeball camera" has a 3.5x optical zoom, takes sharp images, is inexpensive to make and is only the size of a nickel. (A higher zoom is possible with the technology.)

Current Article Ratings:

Patient / Public:	Not yet rated
Healthcare Prof:	Not yet rated

Find other articles on: "[northwestern tunable zoom](#)"

While the camera won't be appearing at Best Buy any time soon, the tunable camera - once optimized - should be useful in many applications, including night-vision surveillance, robotic vision, endoscopic imaging and consumer electronics.

"We were inspired by the human eye, but we wanted to go beyond the human eye," said Yonggang Huang, Joseph Cummings Professor of Civil and Environmental Engineering and Mechanical Engineering at Northwestern's McCormick School of Engineering and Applied Science. "Our goal was to develop something simple that can zoom and capture good images, and we've achieved that."

The tiny camera combines the best of both the human eye and an expensive single-lens reflex (SLR) camera with a zoom lens. It has the simple lens of the human eye, allowing the device to be small, and the zoom capability of the SLR camera without the bulk and weight of a complex lens. The key is that both the simple lens and photodetectors are on flexible substrates, and a hydraulic system can change the shape of the substrates appropriately, enabling a variable zoom.

The research will be published the week of Jan. 17 by the *Proceedings of the National Academy of Sciences* (PNAS).

Huang, co-corresponding author of the PNAS paper, led the theory and design work at Northwestern. His colleague John Rogers, the Lee J. Flory Founder Chair in Engineering and professor of materials science and engineering at the University of Illinois, led the design, experimental and fabrication work. Rogers is a co-corresponding author of the paper.

Earlier eyeball camera designs are incompatible with variable zoom because these cameras have rigid detectors. The detector must change shape as the in-focus image changes shape with magnification. Huang and Rogers and their team use an array of interconnected and flexible silicon photodetectors on a thin, elastic membrane, which can easily change shape. This flexibility opens up the field of possible uses for such a system. (The array builds on their work in stretchable electronics.)

The camera system also has an integrated lens constructed by putting a thin, elastic membrane on a water chamber, with a clear glass window underneath.

Initially both detector and lens are flat. Beneath both the membranes of the detector and the simple lens are chambers filled with water. By extracting water from the detector's chamber, the detector surface becomes a concave hemisphere. (Injecting water back returns the detector to a flat surface.) Injecting water into the chamber of the lens makes the thin membrane become a convex hemisphere.

To achieve an in-focus and magnified image, the researchers actuate the hydraulics to change the curvatures of the lens and detector in a coordinated manner. The shape of the detector must match the varying curvature of the image surface to accommodate continuously adjustable zoom, and this is easily done with this new hemispherical eye camera.

The paper is titled "Dynamically tunable hemispherical electronic eye camera system with adjustable zoom capability." In addition to Huang and Rogers, other authors of the paper are Chaofeng Lu and Ming Li, from Northwestern; Inhwa Jung, Jianliang Xiao, Viktor Malyarchuk and Jongseung Yoon, from the University of Illinois; and Zhuangjian Liu, from the Institute of High Performance Computing, Singapore.

Source:
Megan Fellman
Northwestern University

Please rate this article: [Patient / Public:](#) or [Health Professional:](#)
(Hover over the stars then click to rate)

Ads by Google

[Stryker HD Endoscope](#) - The NEW 1288 HD 3 Chip Camera 1920x1080 with 9 specialty settings - [www.Stryker.com](#)

[Contact Lenses - 70% Off](#) - We offer a wide selection of lenses at 70% off. Shop Lens.com Now. - [www.Lens.com](#)

[Northwestern University](#) - Earn a medical informatics degree online. Apply to the MMI program. - [medinformatics.northwestern.edu](#)

Like
7

SHARE

- [Follow us on Twitter](#)
- [Medical Devices / Diagnostics headlines](#)
- [email to a friend](#)
- [printer friendly version](#)
- [weekly newsletter](#)
- [personalize your news](#)
- [back to top](#)

Note: Any medical information published on this website is not intended as a substitute for informed medical advice and you should not take any action before consulting with a health care professional. For more information, please read our [terms and conditions](#).

Add Your Opinion

All opinions are moderated before being added.

Please note that **we publish your name**, but we **do not publish** your email address. It is only used to let you know when your message is published. We do not use it for any other purpose. Please see our [privacy policy](#) for more information.

If you write about specific medications or operations, please **do not** name health care professionals by name.

Your Name:*

E-mail Address:*

Title For Opinion:*

Opinion:*

This is to help prevent SPAM submissions. Please

enter the words exactly as they appear, including capital letters and punctuation.*

Malpractice suspicions

Type the two words:

Fact #63

195,000 Americans die each year from preventable medical errors

practice fusion™ Free, web-based Electronic Health Records

- News Category Menu
- Medical Devices / Diagnostics
 - Categories A-B >
 - Categories C-D >
 - Categories E-G >
 - Categories H-L >
 - Categories M-O >
 - Categories P-R >
 - Categories S-Z >
 - View full category list
- Your News
- Popular News By Year >
 - Personalize Your Homepage
 - Weekly Newsletters
 - Daily News Alerts

Contact Our News Editors

For any corrections of factual information, or to contact the editors please use our [feedback form](#).

Please send any medical news or health news press releases to: pressrelease@medicalnewstoday.com

- [Back to top](#)
- [Back to front page](#)
- [List of All Medical Articles](#)

[Privacy Policy](#) [Terms and Conditions](#) © 2011 MediLexicon International Ltd

Monthly Feature

The Antibiotics Crisis: How Did We Get Here And Where Do We Go Next?



In recent years there has been a lot of news about the impending antibiotics crisis, brought to a head by renewed awareness that we are running out of drugs to treat evolving superbugs. [Read our article here »](#)

- Featured Information Hubs
- Hemophilia
 - Pneumococcal Disease
 - Other Information Hubs >
 - All 'What Is...' Articles

- Conditions Information
- Abscess (Dental)
 - Acid Reflux
 - Acne
 - Acoustic Neuroma (Vestibular)
 - Addiction
 - Addison's Disease (Primary)
 - ADHD
 - Agoraphobia
 - Air Embolism (Gas Embolism)
 - Alcoholism

- Health Professional Sites
- Ophthalmology
 - Urology

- Other Navigation Links
- About Us
 - News Licensing
 - Free Website Feeds
 - Free Tools & Content
 - Tell a Friend
 - Accessibility
 - Help / FAQ
 - Article Submission
 - Links
 - Contact Us

Clinical Trials



Follow Our News On Twitter:



Get the latest news for this category delivered straight to your Twitter account. Simply click the link below and select the 'follow' option.

- [Medical Devices / Diagnostics](#) on Twitter
- [View a list of all our Twitter feeds](#)

- Latest News For Medical Devices / Diagnostics
- [Gore Receives Health Canada Approval For Removable GORE\(R\) VIABIL\(R\) Biliary Endoprosthesis](#)
19 Jan 2011
 - [New Device Allows Neurosurgeons To Treat Complex Brain Aneurysms Without Open Surgery](#)
19 Jan 2011
 - [Stents Help Stroke Victims When Other Treatments Don't, Research At ISET 2011 Shows](#)
19 Jan 2011
- [View more news...](#)

Most Popular Articles For Medical Devices

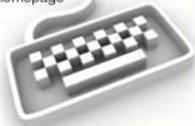
These are the most read articles from this news category for the last 6 months:

-  [Implanted Retinal Chip Allows Blind People To See](#)
03 Nov 2010
A subretinal implant inserted under the retina of three blind people has allowed them to see shapes and objects within days of the procedure, German scientists report in the journal Proceedings of the Royal Society B...
- [Lap-Band Recommended For Less Obese Patients By FDA Panel](#)
04 Dec 2010
- [New Brain Scan Diagnoses Autism In Adults](#)
11 Aug 2010
- [Hip Replacement Recall By Depuy Orthopaedics Is Big News](#)
31 Aug 2010
- [Retinal Implant 'Enables Blind People To See'](#)
03 Nov 2010



Find us on Facebook
Facebook is a registered trademark of Facebook, Inc.

Medical News Gadget
Add our medical news to your Google homepage



Medical Devices Forum
Discuss issues relating to medical devices / diagnostics in our new forum.
Visit the [medical devices forum](#)