



Special Price: \$59.95
ORDER TODAY!



Dr. Dobb's Portal

The World of Software Development

[Site Archive \(Complete\)](#)

[ABOUT US](#) | [CONTACT](#) | [ADVERTISE](#) | [SUBSCRIBE](#) | [SOURCE CODE](#) | [CURRENT PRINT ISSUE](#) | [NEWSLETTERS](#) | [RESOURCES](#) | [BLOGS](#) | [PODCASTS](#) | [CAREERS](#)



DEPARTMENTS

- [Home](#)
- [Architecture & Design](#)
- [C/C++](#)
- [Database](#)
- [Development Tools](#)
- [Embedded Systems](#)
- [High Performance Computing](#)
- [Java](#)
- [Mobility](#)
- [Open Source](#)
- [Security](#)
- [Web Development](#)
- [Windows/.NET](#)

IN THE NEWS

[show me more](#)

[IBM Rational Releases Source Code Analyzer](#)

Tool takes a "grammar checker" approach to catching software bugs
July 30, 2008

[Vision and Programmable Computers; The 'Eyes' Have It](#)

Study suggests human visual system could make a powerful computer
July 30, 2008

[DeviceAnywhere Launches T-Mobile Virtual Developer Lab](#)

July 30, 2008

[1394 Firewire Standard Updated](#)

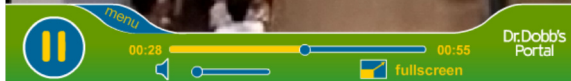
July 29, 2008

[Microsoft Research Unveils Free Software Tools for Scholars](#)

July 29, 2008

[GreenLight Project to Improve Energy Efficiency of Computing](#)

July 28, 2008



Imagine Cup 2008 Winners Announced



[Ads by Google](#)

VIEWPOINTS

[more](#)



EDITOR'S EYE
by Jon Erickson

[Security Report Released: Browser plug-ins and gamers are targets](#)

According to the just released IBM X-Force 2008 Midyear Trend Statistics security report, 94 percent of all browser-related online exploits occurred within 24 hours of official vulnerability disclosure. These "zero-day" exploits are on the Internet before people even know they have a vulnerability that needs to be patched in their systems.

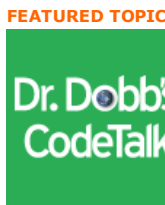
The report believes that criminals' adoption of automated tools for creating and delivering exploit tools, and the lack of a set proto [...] **Mon, 28 Jul 2008 20:00:00 +0100**

EVENTS



October 27-30, 2008
Boston, MA
Join us for **Software Development Best Practices 2008**, Dr. Dobb's premier east coast event, featuring world-class training on the entire software development lifecycle. [Register today and save up to \\$700!](#)

MICROSITES



ADDITIONAL TOPICS

[Agile Data Warehouse PM](#)

A new seminar by Larissa Moss Atlanta - Chicago - Wash DC
[pesg.com](#)

[Atlanta Custom Software](#)

Atlanta based WebApp, Software, DB Consulting, Development Services
[www.innovcare.com](#)

[Web 2.0 Apps in Minutes](#)

Generate database & reporting apps straight from your database!
Try it
[www.ironspeed.com](#)

[Software Deployment Tools](#)

Automated Deployment Software Built for Speed - Find out How Fast
[Serena.com/ALM](#)

[Ads by Google](#)

[Driving to Support Calls?](#)

Stop! Get Powerful Remote Support Tools from LogMeIn. Try For Free.

[www.LogMeIn.com](#)

INFO-LINK

- [Dr. Dobb's DVD: Release 4...ORDER YOUR COPY TODAY!](#)
- [Save up to \\$700 on Software Development Best Practices 2008!](#)
- [Interop New York : Join thousands of business and technology leaders](#)

MOST RECENT ARTICLES

- [Embed Custom GUIs in WPF](#)
- [Building Findable Websites](#)
- [Dr. Dobb's Agile Newsletter 07/08](#)
- [CUDA, Supercomputing for the Masses: Part 6](#)
- [Ellipse Specification Using Vectors](#)

ON THE NEWSSTAND

[show me more](#)

[Engineers Without Borders](#)
Engineers Without Borders is an international humanitarian aid organization that mobilizes



[Enterprise Software](#)

Research & Compare Enterprise Software at Best of the Web!
[verticals.botw.org/software](#)

[Ads by Google](#)

volunteer professionals to solve critical problems in the developing world.

[Patricia Tries](#)

Specialized indexes like the Patricia Trie can lead to faster development and more efficient code.

[Event-Based Architectures](#)

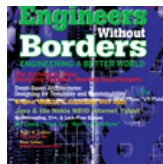
Event-Based Architectures simplify system design, development, and testing because they minimize relationships between system parts.

[Graphs Versus Objects](#)

Graph-based development can help in all areas of knowledge management, including Web 2.0 and beyond.

[Lock-Free Queues](#)

One thread can write and another read—at the same time!



DR. DOBB'S CAREER CENTER

Search jobs on **Dr. Dobb's TechCareers**

Function:

Keyword(s):

State:

- [Post Your Resume](#)
- [Employers Area](#)
- [News & Features](#)
- [Blogs & Forums](#)
- [Career Resources](#)

Browse By:

[Location](#) | [Employer](#) | [City](#)

Most Recent Posts:

[Network Engineer II](#)

Lowe's seeking Network Engineer II in Mooresville, NC

[Sr Analog Design Engr](#)

ON Semiconductor seeking Sr Analog Design Engr in Colorado Springs, CO

[Senior Network Engineer](#)

T-Mobile seeking Senior Network Engineer in Bellevue, WA

[C# .Net Software Engineer](#)

ISES, Inc. seeking C# .Net Software Engineer in Watchung, NJ

[Applications System Analyst 3](#)

SMDC Health System seeking Applications System Analyst 3 in Duluth, MN

APPLY FOR A FREE DR. DOBB'S JOURNAL SUBSCRIPTION

First Name:

Last Name:

Company Name:

Title:

Business Address:

City:

State:

Zip:

Email Address:

NOTE: Free subscriptions are available in the U.S. only.

Dr. Dobb's Portal

The World of Software Development

RESOURCES SECTION.....

Check out the
Dr. Dobb's Portal
Resources
section **TODAY!**

MARKETPLACE (Sponsored Links)

[Discover WinDev 11 RAD](#)

and develop 10 times faster ! ALM, IDE, .Net, PDF, 5GL, Database, 64-bit, etc. Free Express version

[Villanova University Six Sigma & IT Certificate Pr...](#)

100% Online programs in Six Sigma, IS Security, CISSP Prep, Business Analysis, Proj. Mgmt. and more!

[BugSplat - Automatic Crash Analysis](#)

Fast online exception analysis. Capture customer crash data online.

[Cross Platform CORBA Tool](#)

Develop distributed systems conforming to open standards like CORBA and Web Services faster with SAN...

[Domain Name Registrations, Web Hosting, Email](#)

Pay less for Domain Names, Increase your company's bottom line - get a raise. Accredited domain name...

[Advertise With Us](#)

Resource Links

[RSS](#) | [All Feeds](#)

© 2008 Think Services, [Privacy Policy](#), [Terms of Service](#), [United Business Media LLC](#)

Comments about the web site: webmaster@ddj.com

Related Sites: [DotNetJunkies](#), [SD Expo](#), [SqJunkies](#)



Powerful Remote Support - Support On-Demand Customers or Get Proactive with Always-On Support www.LogMeIn.com

Ads by Google



Site Archi

[ABOUT US](#) | [CONTACT](#) | [ADVERTISE](#) | [SUBSCRIBE](#) | [SOURCE CODE](#) | [CURRENT PRINT ISSUE](#) | [NEWSLETTERS](#) | [RESOURCES](#) | [BLOGS](#) | [PODCASTS](#) | [CAREERS](#)

High Performance Computing

July 30, 2008

Vision and Programmable Computers; The 'Eyes' Have It

Study suggests human visual system could make a powerful computer

- [Email](#)
- [Print](#)
- [Reprint](#)
-
- add to:
- [Del.icio.us](#)
- [Slashdot](#)
- [Digg](#)
- [Y! MyWeb](#)
- [Google](#)
- [Blink](#)
- [Furl](#)

Since the idea of using DNA to create faster, smaller, and more powerful [computers](#) originated in 1994, scientists have been scrambling to develop successful ways to use genetic code for computation. Now, research from a professor at [Rensselaer Polytechnic Institute](#) suggests that if we want to carry out artificial computations, all we have to do is literally look around. Assistant Professor of Cognitive Science [Mark Changizi](#) has begun to develop a technique to turn our eyes and visual system into a programmable [computer](#).

Harnessing the computing power of our visual system, according to Changizi, requires visually representing a [computer program](#) in such a way that when an individual views the representation, the visual system naturally carries out the computation and generates a perception.

Ideally, we would be able to glance at a complex visual stimulus (the software program), and our visual system (the hardware) would automatically and effortlessly generate a perception, which would inform us of the output of the computation, Changizi said.

Changizi has begun successfully applying his approach by developing visual representations of digital circuits. A large and important class of computations used in calculators, computers, phones, and most of today's electronic products, digital circuits are constructed from assemblies of logic gates, and always have an output value of zero or one.

"A digital circuit needs wire in order to transmit signals to different parts of the circuit. The 'wire' in a visual representation of a digital circuit is part of the drawing itself, which can be perceived only in two ways," said Changizi, who created visual stimuli to elicit perceptions of an object tilted toward (an output of one) or away (an output of zero) from the viewer. "An input to a digital circuit is a zero or one. Similarly, an input to a visual version of the circuit is an unambiguous cue to the tilt at that part of the circuit."

Changizi used simple drawings of unambiguous boxes as inputs for his visually represented digital circuits. The positioning and shading of each box indicates which direction the image is tilted.

He also created visual representations of the logic gates NOT, which flips a circuit's state from 0 to 1 or vice versa; OR, which outputs 1 if one or both inputs are 1; and AND, which outputs 1 only if both inputs are 1.

"Visually represented NOT gates flip a box's perceived tilt as you work through a circuit, and OR gates are designed with transparency cues so that the elicited perception is always that the box is tilted toward you, unless overridden," Changizi said. "The AND gate is similarly designed with transparency cues, but contrary to the OR gate, it will always favor the perception that it is tilted away from you."

By perceptually walking through Changizi's visual representation of a digital circuit, from the inputs downward to the output, our visual system will naturally carry out the computation so that the "output" of the circuit is the way we perceive the final box to tilt, and thus a one or zero.

"Not only may our visual system one day give DNA computation a run for its money, but visual circuits have many potential advantages for teaching logic," Changizi said. "People are notoriously poor logical reasoners --

SD Best Practices 2008, October 27-30 in Boston



Features world-class training on the entire software development lifecycle. [Register today and save up to \\$700!](#)

DR. DOBB'S CAREER CENTER

Ready to take that job and shove it? [open](#) | [close](#)

Ads by Google

LogMeIn Support Solutions

Grow Your IT Support Business with Proactive and On-Demand Solutions

www.LogMeIn.com

MICROSITES

FEATURED TOPIC



ADDITIONAL TOPICS

INFO-LINK

[Dr. Dobb's DVD: Release 4...ORDER YOUR COPY TODAY!](#)

[Pre-Flight Builds: What They Are and Why You Should Care](#)

[Interop New York : Join thousands of business and technology leaders](#)

someday visual circuits may enable logic-poor individuals to 'see their way' through complex logical formulae."

Although Changizi's visual stimuli are successful at eliciting viewer perception, he says there are still serious difficulties to overcome. The visual logic gates do not always transmit the appropriate perception at the output, and it can be difficult to perceive one's way through these visual circuits, although Changizi argues we may have to train our visual system to work through them, similar to the way we need to be taught to read. Additionally, building larger circuits will require smaller or more specialized visual circuit components.

"My hope is that other perception and illusion experts will think of novel visual components which serve to mimic some digital circuit component, thereby enriching the powers of visual circuits," Changizi said.

RELATED ARTICLES

[IBM Rational Releases Source Code Analyzer](#)

[DeviceAnywhere Launches T-Mobile Virtual Developer Lab](#)

[Embed Custom GUIs in WPF](#)

[1394 Firewire Standard Updated](#)

[Microsoft Research Unveils Free Software Tools for Scholars](#)

TOP 5 ARTICLES

No Top Articles.

Dr. Dobb's Portal

The World of Software Development

RESOURCES SECTION.....

Check out the
Dr. Dobb's Portal
Resources
section **TODAY!**

MARKETPLACE (Sponsored Links)

[Manage the Complexity of a Product Life-cycle](#)

RIQTek Manager.- Manages entire product life-cycle from requirement to maintenance. Build in outsour...

[Flowcharts from C/C++ code -- Free trial download](#)

Understand C/C++ code in less time. A new team member ? Inherited legacy code ? Get up to speed fast...

[Discover WinDev 11 RAD](#)

and develop 10 times faster ! ALM, IDE, .Net, PDF, 5GL, Database, 64-bit, etc. Free Express version

[Virtual Private Servers \(XEN\)](#)

Full Root Access, Multiple Linux Distros, Control panel, Dual Xeon Hosts, Fully Redundant Network, B...

[Domain Name Registrations, Web Hosting, Email](#)

Pay less for Domain Names, Increase your company's bottom line - get a raise. Accredited domain name...

[Advertise With Us](#)

[RSS](#) | [All Feeds](#)

© 2008 Think Services, [Privacy Policy](#), [Terms of Service](#), [United Business Media LLC](#)

Comments about the web site: webmaster@ddj.com

Related Sites: [DotNetJunkies](#), [SD Expo](#), [SqlJunkies](#)