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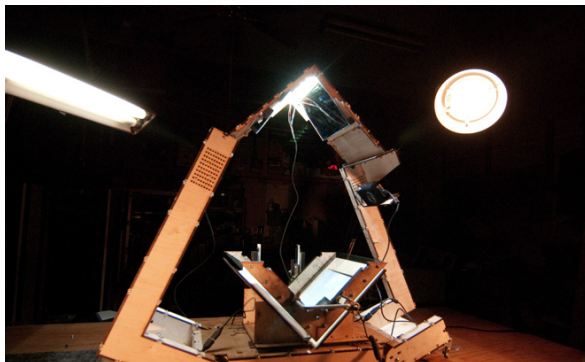
PRIYA GANAPATI   GEAR   12.11.09   7:42 PM

DIY BOOK SCANNERS TURN YOUR BOOKS INTO BYTES

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Reetz dreamed of a book scanner that could crunch textbooks and spit out digital files he could then read on his PC.

Book scanners, like the ones Google is using in its Google Books project, run into thousands of dollars, putting them out of the reach of a graduate student like Reetz. But in January, when textbook prices for the semester were listed, Reetz decided he would make a book scanner that would cost a fraction of commercially available products.

So over three days, and for about $300, he lashed together two lights, two Canon Powershot A590 cameras, a few pieces of acrylic and some chunks of wood to create a book scanner that's fast enough to scan a 400-page book in about 20 minutes. To use it, he simply loads in a book and presses a button, then turns the page and presses the button
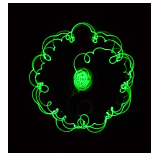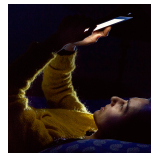
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computer converts the book into a PDF file. The Reetz DIY book scanner isn't automated–you still need to stand by it to turn the pages. But it's fast and inexpensive.

"The hardware is ridiculously simple as long as you are not demanding archival quality," he says. "A dumpster full of building materials, really cheap cameras and outrageous textbook prices was all I needed to do it."

Reetz went on to upload a 79-step how-to guide for building a book scanner (.pdf). The guide has sparked more than 400 comments. It has also spawned a website, DIYbookscanner.org, where more than 50 independent book scanners spread across countries such as Indonesia, Russia and Britain have contributed hardware refinements and software programs.

Now wearing a large black coat

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goes to conferences to show how anyone can create a machine to scan all the books they own.

As consumers turn to e-readers — about 3 million are expected to be sold by the end of the year — they are also looking for ways to bring their old textbooks and paperbacks into the digital world. And a small group is discovering that the best way to do that is to create a scanner yourself. The scanner is also helping digitize out-of-print books and help people with disabilities get features like text-to-speech that publishers won't offer or are downright opposed to.

A DIY book scanner also raises questions of piracy and copyright. The basic question being: Do you really own a book in all its forms when you buy a

create new tools to make copyright information more accessible. Tulane University is building a scanner based on Reetz's design that would let it digitize its collection of copyright documents. That is expected to help the university develop a web-based service called 'Durationator' that would allow anyone to search copyright information about any particular book, to see if it is currently in the public domain or not.

"It's amazing that a DIY book scanner is helping create the very tool that will offer copyright information," says Reetz. "It makes me very proud."

Scanners are commonplace — just walk into a Target, and you can find a scanner-printer combo for $100– but those machines are designed to digitize photos and documents.

A flatbed scanner can take

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an hour-and-a-half to three hours of work. Not to mention that the design of the scanners means that you have to open the book binding wide and press it flat, which can damage the book.

Instead, book scanners are designed to hold the book open at a 90-degree angle. A cradle holds the book face up so that it is gentle on the binding. This kind of scanner is also faster, because it can capture images of two pages simultaneously, using a camera instead of a scanning element. But commercial book scanners that are completely automated cost anywhere from $5,000 to $50,000. The $50,000 Kirtas book scanner, for instance, can capture 3,000 pages an hour.

Reetz's scanner cuts that cost to a bare minimum: All you need are two basic digital cameras and some readily available construction materials. All the software and post-processing

a few hacks and a dash of ingenuity. Inexpensive digital cameras are ideal, but they have limitations. For starters, you need to hold down a button to click a picture. And the two cameras in a book scanner need to be synchronized.

Reetz found a program called Stereodatamaker for Canon cameras that could synchronize multiple cameras and flash. All users have to do it is download it to a SD card and insert it into their camera.

"The cameras are running hacked firmware and it works pretty well," he says."Then we take it to a whole new level for processing the images."

That would be with some help from Scan Tailor, an open source

Russian programmer Joseph Artsimovich. Scan Tailor can take the raw, scanned images of the book and split the pages, add or remove borders and process all of the images into a single file.

"You absolutely need post-processing software for digitizing books," says Artsimovich. "If you try to digitize a book without such software, chances are you will give up because it's just too much work."

From there, a program called Page Builder — written by a friend of Reetz — can take the images and process them into a PDF file.

Reetz says the DIY book-scanning forum isn't about distributing pirated content, but he can see the temptation.

realized getting an 8-megapixel Canon camera was cheaper than buying a bunch of textbooks."

BUT IS IT LEGAL?

So are Reetz and the builders of the DIY scanner pirates? That would depend on who you talk to, says Pamela Samuelson, a professor at University of California at Berkeley, who specializes in digital-copyright law. Trade publishers are almost certain to cry copyright infringement, she says, though it may not necessarily be the case.

Google was recently forced to pay $125 million to settle with angry book publishers and authors who claimed copyright infringement as a result of the search giant's book-scanning project.

But not so individual users who already own the book, says Samuelson. If you scan a book

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deemed to be fair, unless there is a demonstrable showing of harm to the market for the copyright at work," says Samuelson.

For publishers, though, the growth of the DIY scanning community could hurt. Publishers today sell digital versions to customers who already own hardcover or paperback versions of the same book.

"You cannot look at this idea from the perspective of whether the publisher can make extra money," says Samuelson. "Publishers would love it if you can't resell books either, but that's not going to happen."

Instead, communities such as these are likely to force publishers to offer more value to customers, she says.

"There have to be things that you get with an e-book that you don't get by making your own copies,"

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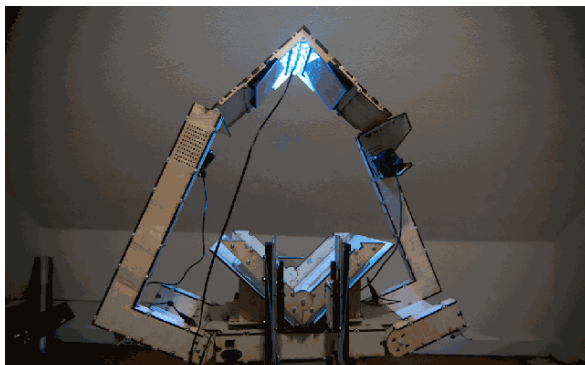
people are going to take the trouble to make their own scanner system. Most of us want the convenience of buying digital books for the Kindle, Nook or Sony Reader."

And unless, it becomes a hotbed of pirated content, the DIY scanner is unlikely to have a Napster-like end, says Samuelson.

Check out the video below of Daniel Reetz talking about why DIY scanner is fun.

DIY Book Scanner Introduction and Motivation from Daniel Reetz on Vimeo.

The DIY book scanner looks like this, from different angles.

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scanner/Daniel Reetz

Second photo: Daniel Reetz shows his DIY book scanner. (sloanro/Flickr)

#BOOKS #DIY #EBOOKS

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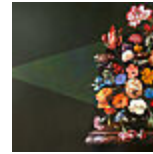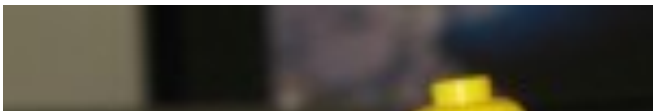### Facebook Sued for Sexism by Ex-Worker Repped by Pao Lawyers

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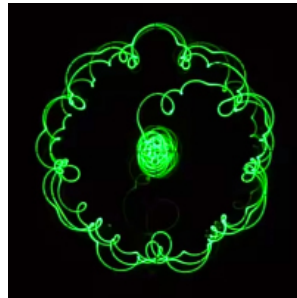
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