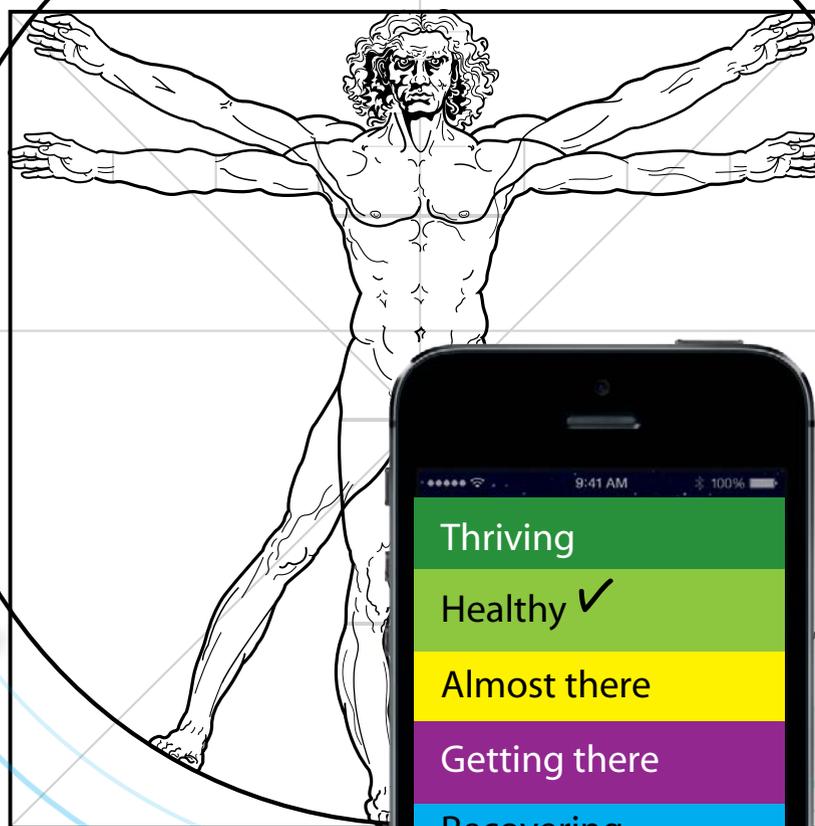




Washington Apple Pi Journal

**Smart Devices &
Healthy Living**





Washington Apple Pi

Journal

Fall 2013
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President's Page

Diana King

Summer is supposed to be kind of a laid back time in our lives, but around Washington Apple Pi we have been pretty busy. At our June Board of Directors meeting, the idea arose of reviewing the WAP bylaws to see what might need revision. Raju Tonapi and Jed Sorokin-Altman took on the job of first review and came up with a draft of proposed changes that were considered and further revised at the latest board meeting. Before the end of the year, we shall probably be presenting the changes at a General Meeting for consideration and, we hope, approval.

Another project is the possible redesign of the public portion of the Pi website. A committee is now working with webmaster Lawrence Charters on some ideas for this. If any member reading this column would like to join the committee—or even make suggestions—please communicate by using the president@wap.org address.

Having introduced the topic of volunteering, I should continue to say again that although we have a cadre of dedicated people who are doing amazing

work to keep this club going and provide services to our members, we can **always** use more help. We are constantly looking for more suggestions for presenters and topics for the monthly General Meetings. If you know of anyone who can do a one-hour presentation on Mac-related topics—software, hardware, whatever—get in touch. Not every suggestion comes to fruition, not every person we try to contact responds, but we like to try. Every day more and more people use Apple products and make more discoveries about them that they can share. We need your help to let us know about them.

Finally, we have recently begun to communicate with the other two local Mac user groups, Virginia Macintosh User's Group (VMUG) and National Capital Area Macintosh User's Group (NCA-MUG). We are hoping that the clubs can sometimes combine forces and hold joint meetings that could attract speakers who hesitate to travel very far unless the audience is large. Meanwhile we are looking forward to the annual appearance of Apple's Aaron Davis at our own November General Meeting.

See you there!



Editor's Page

Jay Castillo

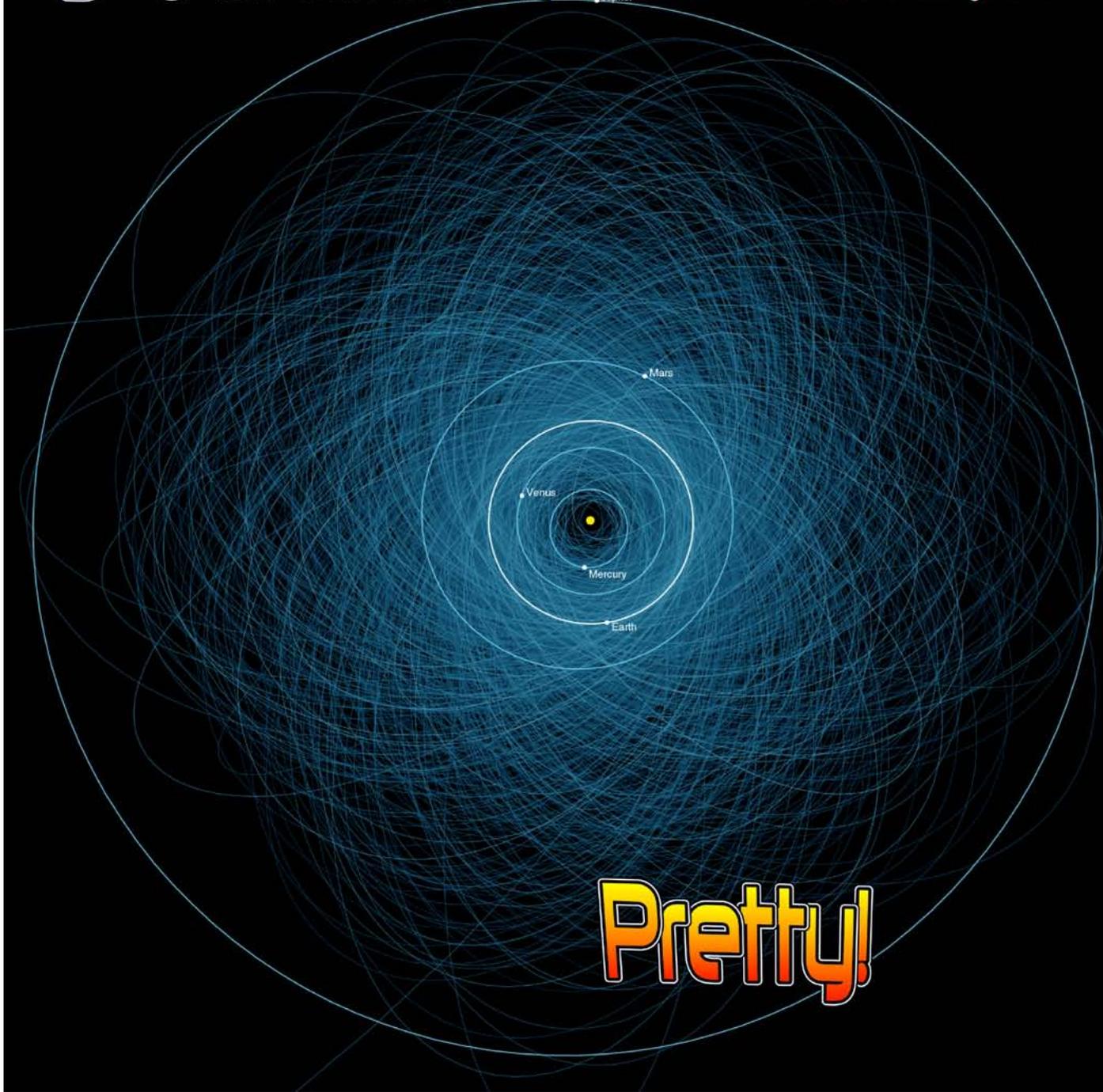
Fall has arrived, bringing with it our Fall *Pi Journal*. Our cover articles are a trio on the theme of your Apple devices and your health. The team of Kathleen and Lawrence Charters brings health care and Mac expertise to our aid. Gerald Berman applies first aid to his Mac Pro laptop as he describes how he replaced his hard drive with a solid state drive and greatly improved his imagery processing tasks. I review the book, *Take Control of Your Online Privacy*, by Joe Kissell. He presents guidance on how you should (and should not) use the web. You can easily ensure that your activities are secure and as private and anonymous as you desire.

We also provide three *TidBits* reprints in this issue. The first is a review of Google's Chromecast, the cheaper and less capable alternative to Apple TV. It's a dongle that relies on the *Chrome* web browser and compatible apps to broadcast to it. The second is a student's review of technology in the classroom. The third article is an entry in the Puzzle and Game Corner, reviewing *Blackbar*, a topical word puzzle.

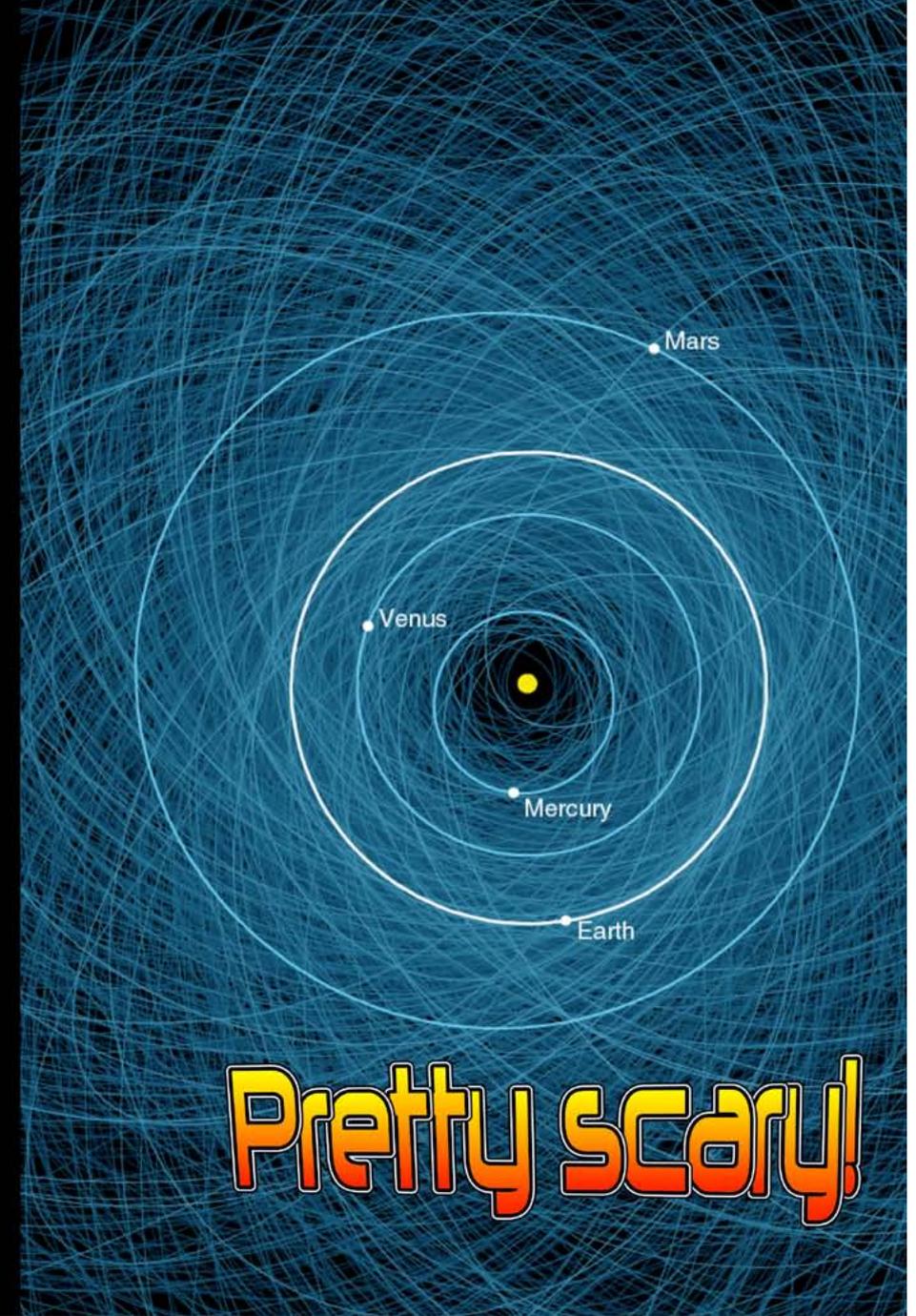
I was paging through an old print edition of the *Journal*, and I noticed an article presenting a profile of one of the Pi members. Past *Journal* occasionally carried such articles. As some of us were chatting at a recent Clubhouse Saturday, it was remarked how interesting and varied were the backgrounds and expertise of many of our members. So if you would like to inform us about your life and times, or recommend to one of our members that we would enjoy knowing about them, please let us know (<mailto:editor@wap.org>) or send us a draft article.



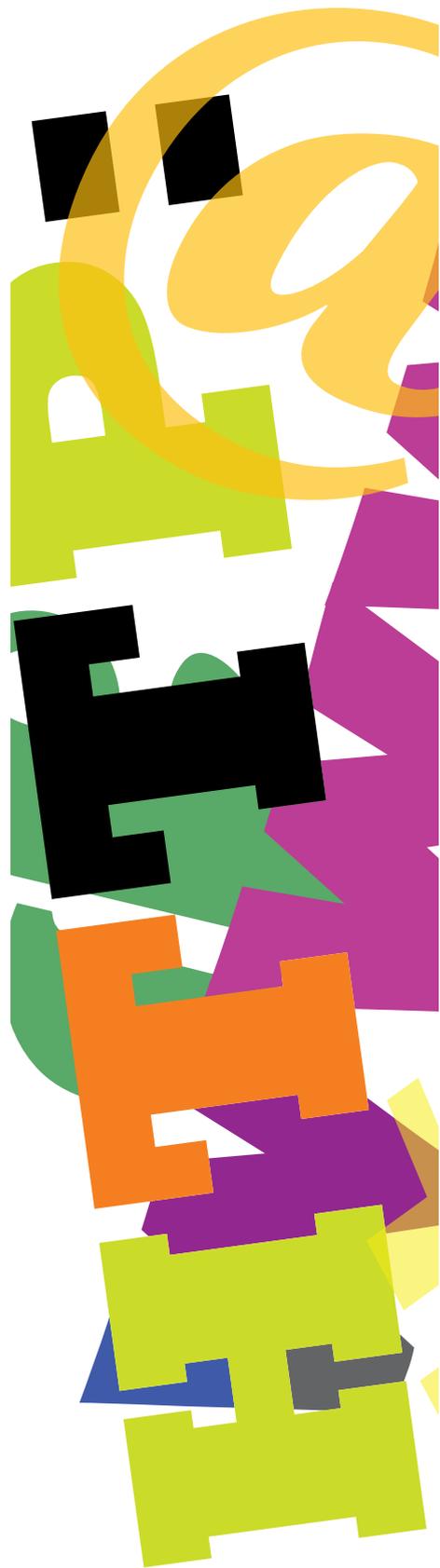
POTENTIALLY HARMFUL ASTEROIDS



Pretty!

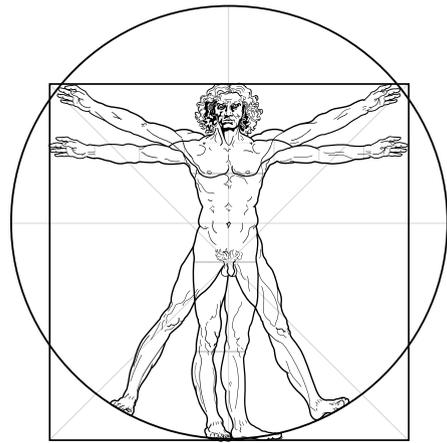


Pretty scary!



Hot Links

- But how do they get them back? Hawaiian Airlines will offer passengers on its big jets iPad Minis to use during the flight.
<http://appadvice.com/appnn/2013/08/hawaiian-airlines-to-offer-ipad-minis-on-all-its-boeing-767-300-aircraft>
- iOS sign language application is significantly improved. Learn American Sign Language with this video based tool:
<http://appadvice.com/appnn/2013/08/sign-language-app-featuring-oscar-winner-marlee-matlin-gets-significant-update>
- I feel the need...the need for speed. Find out how fast your Mac really is:
<http://mac360.com/2013/08/how-to-know-how-fast-your-mac-really-is/>
- Now where did I put that ebook? Clean up your virtual library with Calibre:
http://www.macworld.com/article/2046381/cleaning-up-an-ebook-library-with-calibre.html - tk.nl_mwhelp
- O.K., I'm finally going to get rid of my closet full of old Macs. But first what to do before selling or giving them away:
http://support.apple.com/kb/HT5189?viewlocale=en_US&locale=en_US
- Use AirPlay from your Mac to your TV, even if your Mac is older than mid 2011:
http://mac.tutsplus.com/tutorials/media/five-ways-to-airplay-from-your-mac-to-your-television/?utm_source=feedburner&utm_medium=feed&utm_campaign=Feed%3A+mactuts+%28Mactuts+%29
- I think I'll get a skinny latte venti and surf the web at the outdoor tables. Not so fast, pilgrim!
<http://www.pcworld.com/article/2043095/heres-what-an-eavesdropper-sees-when-you-use-an-unsecured-wi-fi-hotspot.html>



Cover Story

Your Mac and Your Health

© 2013 Kathleen G. Charters, PhD, and Lawrence I. Charters

Now a new age is dawning, an age in which your computer takes an active role in keeping you healthy.

Over the past 35 years, Washington Apple Pi has published countless articles and answered countless Q&A session questions about computer health.

There have also been articles and presentations on your health as you use the computer, stressing taking breaks and using ergonomic furniture.

Now a new age is dawning, an age in which your computer takes an active role in keeping you healthy. This isn't exactly a new idea; over 30 years ago, there were programs on the Apple II and TRS-80 that charted your biorhythms and, for those wanting a family, attempted to predict peak periods of fertility.

In 2013, you can go well beyond those capabilities, using specialized devices that talk to your Mac (or iPhone or iPad), and a growing number of science-based web sites for tracking health.

Why do you need it? Until the 19th century, virtually every human activity required either human or animal muscle. If you wanted to travel, you either walked, or rode in an animal-powered cart, or rode an animal. Even wind-powered

vessels required human muscles to hoist and lower sails, raise masts, and move rudders. Gathering food, fixing meals and cleaning clothing and the home filled an entire day with muscle-powered activity. Work for pay, for the vast majority of humanity, meant hard physical labor.

Since then, at least in the industrial world, animal and human muscle power has been steadily replaced with mechanical, electrical, and chemical power. We burn billions of tons of chemicals to power our cars, ships and planes; consume mountains of coal to power our electric lights; and frequently spend all day "working" at a desk, without ever lifting something heavier than a stack of paper. On the one hand, the move from muscle to mechanical power has drastically reduced the number of home and workplace injuries and deaths, greatly increasing life expectancy. On the other hand, we don't get enough physical activity to remain healthy.

Apple first got into health almost by accident, with the release of Nike+ for the iPod in 2006. A partnership between Apple and Nike, the Nike+ device was designed to be clipped to the laces of running shoes, or embedded in a pocket in the shoe.

It recorded the pace, calories, elapsed time and distance of a run or workout, with the bonus that the user could listen to music while exercising. The user then logged into a Nike website to see the results. Apple still sells the Nike+ sensor.

With the introduction of the iPhone, Apple made some modifications that allowed the Nike+ sensor to be used with their new phone. The combination of an exercise tracker and a powerful mobile computer disguised as a phone proved to be a winner.

Later still, Apple added the Nike+ technology to various models of the iPod nano and iPod touch. While it is a little publicized function, using an iPod nano as a pedometer was a stroke of genius: set it up to record, and it will record your steps. Recording steps doesn't interfere with other functions, so you can still listen to music, or the radio, or whatever other functions your version of the nano might offer.

Not only does it record your steps, it automatically logs them into a calendar, right on the iPod. When you sync the nano to your Mac via *iTunes*, it offers to link you to the Nike+ website, where your activity can be uploaded and you can see how well you are



The original Nike+ iPod sensor (still sold by Apple) is designed to be clipped to or tucked into running shoes to track your activity.

doing compared to others in the Nike+ community.

A number of apps for the iPod touch and iPhone have similar capabilities but don't work quite as well and cost more, too. Considering that a nano costs not much more than a decent pedometer, this is a function worth exploring.

Alas, Nike made some drastic changes to their website last year, promoting their non-standard "Nike Fuel" idea to replace more standard metrics like steps. But other vendors have stepped in with new devices to help your Mac help you with your health. One example, the Fitbit, is the subject of another article in this issue of the *Journal*.



The current iPod nano includes a Nike+ application that works with the built-in accelerometer to measure your activity while you chill out to the built-in radio or your stored music.

Resources

Apple iPod nano

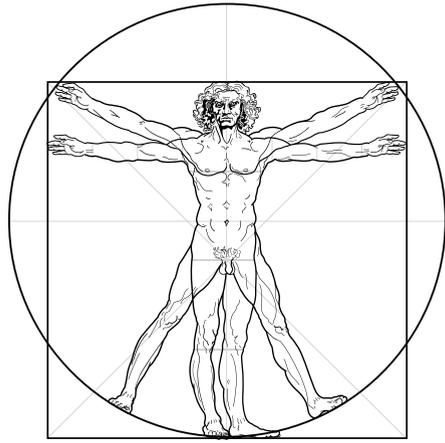
<http://www.apple.com/ipod-nano/>

\$149.00

Nike+ iPod Sensor

<http://www.apple.com/ipod/nike/run.html>

\$19.00



Cover Story

Fitbit for Fit Activities

© 2013 Lawrence I. Charters and Kathleen G. Charters, PhD

The Fitbit is a small electronic activity monitor that you clip to your belt, bra, or other article of clothing. It tracks steps taken, distance traveled, stairs climbed, and hours of sleep. Through your home computer and network, it transmits that information to a web site where you can track your progress over time. If you have an iPhone or iPad, it can synchronize this data to an iPhone app. It is an ingenious, inexpensive, and possibly life-saving piece of wearable technology.



The Fitbit Ultra is still available from some retailers, but the company has discontinued it. The square object is a stand for the recharger and sync cradle, which attaches to your Mac (or some lesser computer) via USB. The Fitbit Ultra itself is quite small, as you can see from the quarter. Not shown is the cloth Sleep Band for holding the Fitbit on your wrist as you sleep.

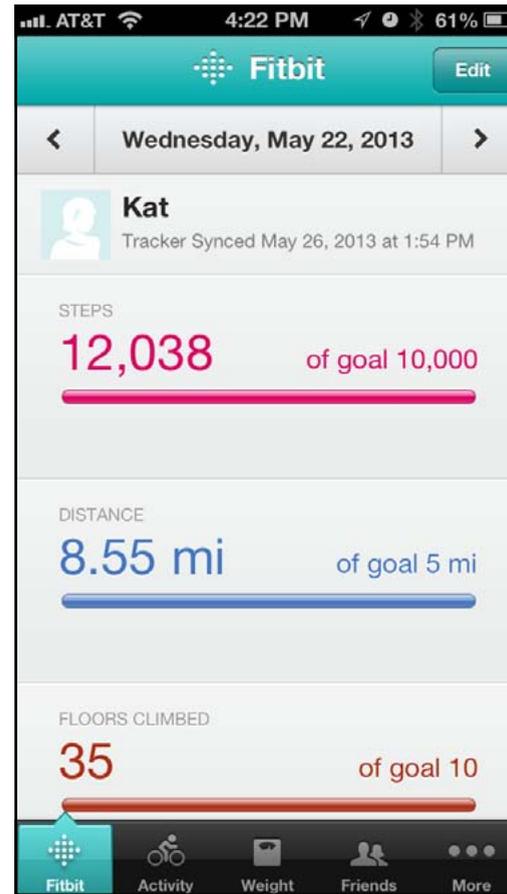
The Fitbit can't make you more active, but it certainly can document with precision your level of activity. As a general rule, adults should walk roughly 10,000 steps every day to keep all the various body parts happy, and get eight hours of sleep. In the U.S., only a fraction of adults reach the step goal, and sleep deprivation is increasingly seen as a serious problem rivaling excess weight.

Monitoring steps can be done with a mechanical pedometer, but pedometers are generally not that reliable, and keep no records. The Fitbit reliably tracks not only your steps, but also the number of floors you've climbed in a day, and it uses multiple electronic accelerometers to track the intensity of your activity. It can keep track of your activity for as long as a week between recharges. Periodic syncing to your iPhone, iPad or computer allows you to gather extensive evidence regarding your level of activity, and the Fitbit website awards badges as you reach certain milestones, such as meeting your step quota, or quota for floors climbed, or distance. You can receive a weekly summary of your activity and badges earned by email.



Fitbit One is the replacement for the Fitbit Ultra. A very short USB cable has replaced the recharging cradle, with a custom clip at one end to hold the electrical connections. Below the quarter you can see the USB Bluetooth dongle that allows the Fitbit One to talk wirelessly to your Mac. (It can also use Bluetooth to talk wirelessly to an iPhone 4S or later, or an iPad 2 or later). The object in the bottom right corner is a flexible holster for the Ultra, with a strong metal clip, for clipping to belts, pockets, pants, bras, and other items of clothing. Not shown is the cloth Sleep Band for holding the Fitbit on your wrist as you sleep.

Sleep tracking is where the Fitbit really shines, as conventional sleep logs are difficult to maintain accurately. You wear the Fitbit attached to a wristband, and it tracks your body motion during sleep. Most people will probably be shocked at how poorly they sleep, and having a running record provides a powerful incentive to work on getting a proper night's rest.



This screen shot from the Fitbit iPhone app shows a summary of activity so far that day. The same app is used on the iPad, but unfortunately is not designed for the iPad; it looks exactly the same, just larger.

The Fitbit website allows you to track your food intake, but this is a manual process — you enter items in the food log via a computer or an iPhone app — and isn't as easy as activity tracking. The web site also allows you to log heart rate, blood pressure, and glucose readings, but like the food log, these must be entered manually.



Scrolling the summary screen on the Fitbit iPhone app brings up more information, including weight (measured by a different device, the Fitbit Aria wireless bathroom scale) and the sleep summary. The Fitbit recorded that the wearer went to bed late, got up early, and woke up three times during the night, for a pathetic five hours and twelve minutes of sleep, well under the recommended eight hours.

Most people will probably be shocked at how poorly they sleep, and having a running record provides a powerful incentive to work on getting a proper night's rest.

Both of us tested the Fitbit Ultra tracker and quickly found the ease of use to be addicting. We wore it everywhere except the shower and swimming pool, tracking our steps, floors, and sleep. We soon found ourselves going out of our way to meet the daily step and floor quota, and slowly but surely carving out time for good, quality sleep. We like the way the Fitbit provides feedback on activity and sleep with minimal effort. We found another app that requires less effort to record what we eat. Living healthy requires a balance between level of activity, good nutrition, and adequate sleep.

An accident severely damaged one of the Fitbit Ultras, and we replaced it with the new Fitbit One. The design and peripherals differ, but it has the same basic functions. For reasons not entirely clear, it isn't as good at detecting climbing floors; after a day that involved climbing 12 to 18 floors, it often credited us with only four or five. The Fitbit One (unlike the older Ultra) is also supposed to sync with an iPhone or iPad over Bluetooth, and it does—maybe. The iPhone needs to be an iPhone 4S or newer, and the iPad must be an iPad 2 or newer; older iPhones and iPads don't support Bluetooth syncing.

We are great fans of the Fitbit, going so far as to encourage friends, relatives, and coworkers and sometimes even complete strangers, to get one. It is a tiny piece of technology with the potential to extend your life.

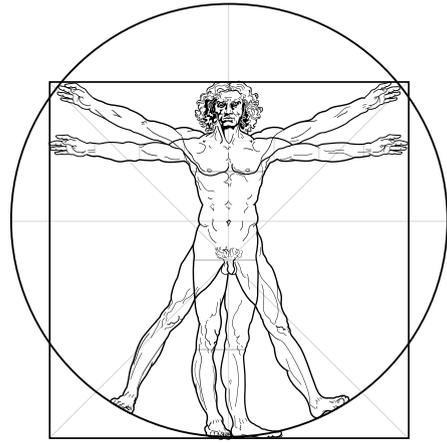
Resources

Fitbit One wireless activity and sleep tracker:

<http://www.fitbit.com/one>

\$99.95.

The Fitbit One, and its less expensive (and less capable) sister, the Fitbit Zip, are also sold by Apple's online store, and at larger Apple brick-and-mortar stores.



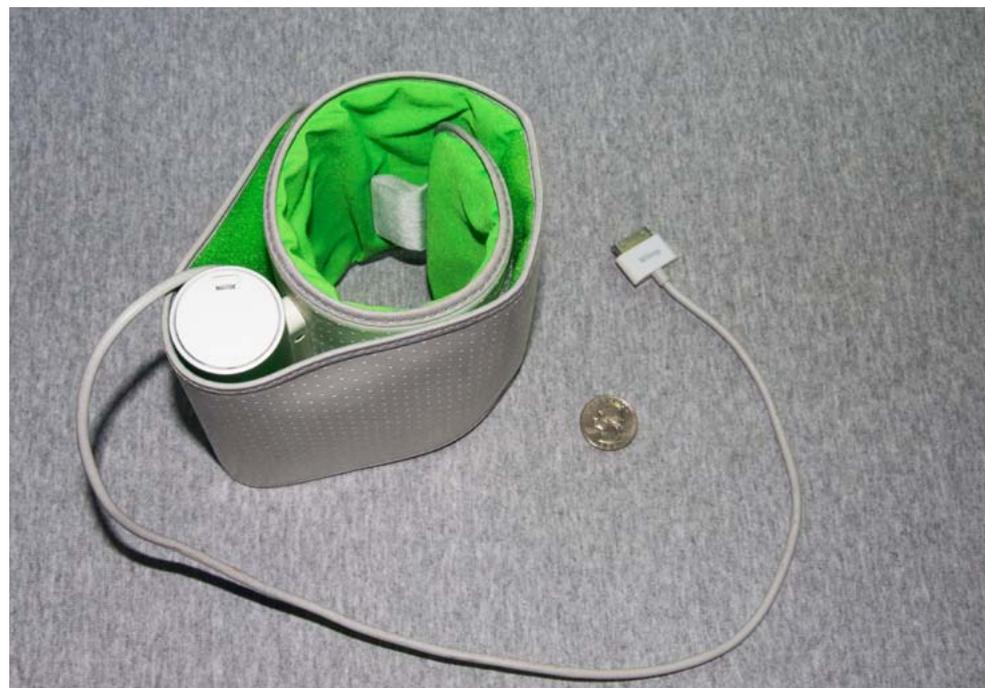
Cover Story

Withings Blood Pressure Monitor

© 2013 Kathleen G. Charters, PhD, and Lawrence I. Charters

Recording your blood pressure can be difficult. While there are a number of conventional blood pressure cuffs that supposedly allow you to do this yourself, they are awkward at best and often infuriating. Not so the Withings Blood Pressure Monitor. The cuff looks like a standard blood pressure cuff, only with an aluminum tube and a dangling cable with an iPhone plug (the older one, not the new iPhone 5 style) on the end. The aluminum tube holds four AAA batteries and the electronics for the cuff, including the pump to inflate it (Figure 1). Plug the cable into an iPhone or iPad (you will need an adapter, obviously, for

Figure 1. The blood pressure monitor holds four AAA batteries plus the electronics in the aluminum tube. The cuff fastens with Velcro to ensure a secure fit.



the iPhone 5 or iPad mini), and the companion Withings app launches. The app guides you through simple instructions on how to take your blood pressure (sit down, sit straight, put your feet flat on the floor, etc.) and then, after you press Start, inflates the cuff and records the reading.



Figure 2. Blood pressure readings on an iPhone are compact, with color-coded dots telling you if an individual reading is good, or bad, and including a date and time stamp. The graph shows trends over time.

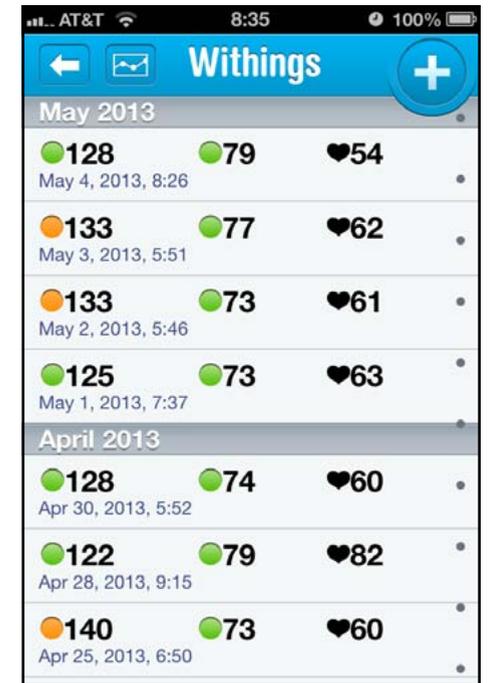


Figure 3. You can also select a screen that gives a tabular listing of blood pressure readings over time.

The results are color-coded, so even if you didn't know that 148 over 110 is bad, the color coding will give you a clue. The results are also transmitted (in this case, by the iPad or iPhone) to the Withings website, where you can log in via a Web browser and see your history. Of course, the history is also shown on your iPhone or iPad, in both tabular form and nice, pretty graphs (Figures 2 and 3).



January 2013			
Jan 4, 2013, 6:27	123	73	50
Jan 2, 2013, 6:57	111	68	54
Jan 1, 2013, 9:17	110	66	62
December 2012			
Dec 31, 2012, 6:25	116	67	78
Dec 25, 2012, 8:58	110	75	67
Dec 20, 2012, 7:17	116	69	60
Dec 19, 2012, 6:50	114	73	61
Dec 18, 2012, 6:54	108	64	54
Dec 17, 2012, 6:49	125	81	65
Dec 14, 2012, 7:50	106	65	66
Dec 12, 2012, 8:29	118	76	74
Dec 9, 2012, 6:15	113	70	59
Dec 8, 2012, 7:54	113	74	72
Dec 7, 2012, 6:29	117	69	63
Dec 4, 2012, 6:22	115	64	58

Figure 4 (left). This view, shown on an iPad, displays morning readings over a period from November 2012 to January 2013. Icons at the bottom allow you to switch to a tabular view, or display just morning or evening readings. The view on the Withings web site closely matches the iPad view.

Figure 5 (right). Physicians and nurses very much appreciate the tabular view, as it presents the blood pressure data in a clear and concise manner.

This feature alone would be a huge advance for most people—fast, accurate blood pressure measurements, without a health care appointment— but your Mac and your iPhone allow you to do even more. If you don't take your blood pressure for several days, the Withings app will put up a little red notification on the app icon (Apple calls this a "badge app icon") that says, in essence, "Pay attention to me." Launching the Withings app will then inform you that you need to take your blood pressure. Nagging, yes, but a very gentle, low pressure nagging. You can also sign up for periodic email notifications from Withings.

The Withings web site, iPhone app and iPad app all present the same information, but the iPhone app is pared down to the bare essentials due to space limitations. On an iPad or the Withings web site, information is designed to take advantage of the extra space, and you can pinch or stretch the graph to show shorter or extended periods of time, or select just morning or evening readings (Figures 4 and 5).

The same iPhone and iPad app can also be used with the Withings Wireless Scale, but that is the subject of a different article.

Resources

Withings Blood Pressure Monitor

<http://www.withings.com/bloodpressuremonitor>

\$129.95. The monitor is also available through Apple's online store as well as at the larger brick-and-mortar Apple Stores.

TAKE CONTROL OF YOUR ONLINE PRIVACY THE CHEAT SHEET

In a Nutshell

It is the nature of the Internet is to collect, store, and disperse information. As such, true online privacy is practically nonexistent, and most of what seems to be privacy is an illusion. Even the simple act of browsing the Web can reveal an astonishing amount of personal data about you.

Most of the time, it's advertisers who want to learn all about you, the better to sell you things via targeted ads. But other people could be watching you too—employers, banks, insurance companies, hackers, and even the government. If you think that's creepy and worrisome, you can take a number of steps to increase the likelihood that your information will remain private.

Your Internet Connection

Start by securing your connection to the Internet itself:

- Always use WPA on any Wi-Fi network that you control.
- Use a VPN on any open or unfamiliar network.
- Turn on your firewall.

Web Browsing

As you use the Web, a number of practices help keep your personal information private:

- Disable third-party cookies in your browsers.
- Make sure sites that require you to log in use HTTPS.
- Use browser extensions such as Adblock Plus and Ghostery that block ads and tracking.
- Keep passwords, credit card numbers, and other sensitive data in a secure password manager.
- Try DuckDuckGo for anonymous Web searches.
- For anonymous Web browsing (with a severe speed penalty), try using Tor.

Email

Email is hard to keep private because it always involves at least two parties and you never have control over what happens on the other end. Even so, you should do the following:

- Always log in to your email account using SSL.
- Encrypt email messages (or at least attached files) that contain extremely sensitive information.
- Use other communication methods when you need to avoid the inherent risks of email.

Social Media

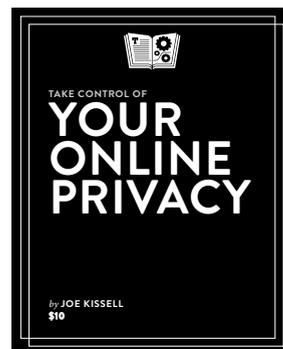
Social media by definition involves sharing information, but you can still:

- Check the privacy settings for each site or service you use (Facebook, Twitter, etc.) and make sure you know who can see what.
- Limit friend lists to people you actually know.
- Limit apps when possible; some can read everything you write.
- Don't assume "private" messages really are.
- Use good passwords—and don't share them!

File Sharing

Don't even think about sharing pirated media—it isn't worth it. For greater privacy when sharing other files, however:

- Don't depend on the encryption built into a cloud sync service (like Dropbox); encrypt sensitive files yourself first.
- In lieu of BitTorrent, consider friend-to-friend networks such as Retroshare or create your own private cloud using a Transporter or similar NAS device.



Buy the book at
takecontrolbooks.com/online-privacy

Book Review

A Review of *Take Control of Your Online Privacy*, by Joe Kissell

Jay Castillo

As a member of the Washington Apple Pi leadership team, I am keenly aware of the importance of informing our members of the need for secure personal computing. But what does that mean? We tend to use the term "secure" in an imprecise way. I decided I needed to learn more about what exactly "security" means, especially in light of the recent reports of pervasive government collection of vast amounts of domestic Internet data. *Take Control of Your Online Privacy*, by Joe Kissell, explains in a relatively brief (118 pages) and easy read, the potential privacy risks we face in our everyday online activities, and suggests strategies to protect against them.

In his Introduction, Kissell makes several points that, to me, vividly clarify the Internet environment. They are worth quoting:

Once something has traveled over the Internet in any way, it's potentially out there forever—and potentially public. You can delete a file from your computer, but once data has gone into the cloud, there's never a guarantee that all copies of it have been eternally expunged. In fact, it's far more likely that any given piece of data on the Internet will live on indefinitely. Not only that, but data tends to escape even strong restraints—hence the saying 'information wants to be free.'

To be brutally honest, someone who wants badly enough to learn what you've transmitted or received on the Internet can probably do so, given enough time, effort, and skill. Part of the reason for this book is to explain how your words, personal information, and activities could become known to individual strangers or even the

public—and that knowledge may lead you to make different choices about how you use the Internet.

Another important point Kissell makes is the distinction between privacy, security and anonymity. We should be clear about which of these attributes we seek:

The words privacy and security are often tossed around as though they're synonymous, and some people also confuse privacy with anonymity. In fact, these three words all mean different things, but the concepts are related, especially when it comes to the Internet. The basics:

- Privacy is freedom from observation or attention.
- Security is freedom from danger or harm.
- Anonymity is freedom from identification or recognition.

To picture the difference between privacy and security, think of a bear. If you visit a bear in a zoo, you have no privacy (anyone can see you) but you have near-total security in regard to the bear: it's very unlikely the bear will harm you or anyone else. On the other hand, if you're in a tent in the woods, you might have privacy

(no one can see you) but not security (a bear could still harm you in your tent). Either way, you're anonymous from the bear's point of view (he doesn't know you), but once your remains are identified, we'll all know who you were.

Bears tend not to use the Internet, but you might have privacy online if no one can see what you type, the contents of your email, which sites you visit, and so on without your permission. If you are safe from malware, hackers, and other potential causes of harm (including data theft), that's security. And if you send a message or visit a Web site without anyone being able to tell that it was you in particular who did so, that's anonymity.

Computer security can often increase your privacy, just as a lock on your door (security) can prevent someone from opening it and seeing you in your underwear (privacy). But there are situations in which you might have privacy without security, and vice-versa.

Likewise, if I send you a message only the two of us can read, it's private—but not anonymous if we know each other's identity. If I post a com-

ment anonymously on YouTube, it's not private at all, even though no one may know who it's from.

Kissell devotes the first four chapters of his book to the basics. He begins with "Identify your online privacy needs." Learn what you have to hide, and learn who wants your private data and why. Next is "Take preliminary steps." Develop a privacy strategy, and keep your Internet connection private. The third chapter covers "Using specific online services privately." Browse the web privately and improve email privacy. Also, talk and chat privately, keep social media "sort of private-ish," keep file syncing and backups private, and share files privately. The fourth chapter deals with "Helping others with their online privacy," in which Kissell emphasizes the need to maintain privacy for your children.

The author recommends reading the first four chapters to understand the basic risks before going on to the later and more specific chapters that may be of particular interest to you. One of his most important points, I think, is what he calls, "Taking the pledge: promise me, yourself, and the rest of the world you won't do stupid things online (see page 32)." This is our best defense.

One of the best things about this book, in my view, is that most of the things Kissell suggests to increase your online privacy and security can be done via the preference settings of specific applications and devices you already have. As I read the book, I followed his recommendations to check and change my preferences. He also recommends turning off certain unnecessary services. Turn off any sharing or location service you don't use, or if you use it only rarely, leave it off until it's needed. He also reminds us of the need for strong, unique passwords, using a password manager, and turning on firewalls.

Kissell does recommend a few third party applications to consider for privacy, security, or anonymity. One I had already taken advantage of is the search engine DuckDuckGo. All searches are completely anonymous, nothing is logged, and no tracking occurs. A great bonus for me is that there are no ads!

Now that I have two young grandchildren, Kissell's reminders about maintaining privacy for children particularly struck me. The Children's Online Privacy Act prohibits web sites or online services aimed at children from collecting personally identifiable information from children under age 13 without pa-

rental consent. But Kissell makes the cogent point that, even before children venture onto the web on their own, we may put their online privacy at risk. The choices we make about what we post about them are a great responsibility. This quote is worth remembering:

Everything you say about your child online—every picture and video, every story told or fact revealed—becomes part of your child's permanent Internet record. You can't ever take it back, and you can't ever control how it might be used. And things that seem innocent now might cause all sorts of problems for your child in 10 or 15 years.

None of this means you should never talk about your child online or post photos or videos. It only means you should do so circumspectly and sparingly. You'll have to determine your own rules, but here are my tips:

- Never post anything online that could be used to predict your child's location (including a route to or from school), at least when a parent isn't around. This includes images with signs or landmarks in the background.
- No matter how cute your kid is in the bath-

tub, seriously, don't post any nude photos online. (You did *Take the Pledge*, right?)

- Blog posts and other stories about your child's behavior problems might have far-reaching consequences. Keep it positive.
- Kids say and do the darnedest things, but even though your children's antics may entertain other adults, they could result in untold cruelty in the hands of a class bully a few years from now.

Be super careful about sharing anything that has the potential to embarrass your child in the future.

I think this book would benefit all Pi members. Those who consider themselves savvy on the topics will find it a good refresher and checklist. Those who need assistance will find clear and easy instructions for enhancing secure, private, and anonymous Internet activity. The author has provided a Cheat Sheet of the main points and key tips of the book for sharing (see page 15, above).

Take Control of Your Online Privacy,
ISBN: 978-1-61542-425-2, available for \$10 from
<http://www.takecontrolbooks.com>

How I Upgraded to a Solid State Drive and Lived to Tell the Tale

Gerald A. Berman

I have a mid-2010 13" MacBook Pro, which came with a 2.4 GHz Core Duo processor, 4 GB RAM, and a 250 GB hard-drive (5400 RPM). Aside from using the computer for the usual email, Web browsing, and producing occasional letters, presentations and spreadsheets, my main activity has been making movies of my kids' lives using *iMovie*. This required importing tons of material from digitized old 8 mm silent home movies, archival and recent photos, and audio from old tape recordings.

The amount of imported material was quite extensive, and with an already existing large *iTunes* music library, the combined collection of data consumed over three quarters of the internal hard-drive capacity. To leave space for producing movies, I put the entire combined collection on an external hard drive. I chose a 1 TB drive with Thunderbolt connectivity to ensure an adequate data transfer rate.

This meant I had to transport not only the laptop but also two external hard-drives (external storage

and Time Machine) when I moved about, which was both tiresome and unwieldy. In addition, I found that the performance of *iMovie* suffered as the number and length of the movies increased. I attributed the slowdown to the data transfer rate of the internal hard-drive and fetching activities from the external *iTunes* and project resources.

What to do? I could (1) buy a new faster computer with increased internal storage, or (2) Install a larger capacity solid-state drive in my current computer. I opted for the latter, as the relative price difference was virtually an order of magnitude. The price for a 500 GB SSD was in the \$300+ range and an all-decked-out MacBook Pro with retina display and a 500 GB SSD was nearly \$3000 .

How I Did It

Having made the decision to upgrade my current MacBook Pro, I needed to figure out how to do it. My first stop was the Apple Store to see what they would charge. They told me they only replace items

with original equipment, and since the computer came with a 250 GB (5400 RPM) hard-drive that's all they would install. OK, scratch that!

I next went to a local computer store with the same story. They quoted a price of \$100 to install the SSD if I supplied it. That price also included installing a new copy of the operating system (Mountain Lion 10.8.4). They said that restoring the system as it was was up to me. Since I had never opened the computer and was very concerned about messing up something inside, I thought that was a good compromise. My teenage grandson, who is computer literate and an avid Apple fan and user, persuaded me otherwise though. He said that opening the machine and replacing the hard drive was no big deal and I was a wimp if I didn't do it myself and save the \$100.

The first step was to figure out the best and safest way, for me to install the SSD and restore the system without losing data or wiping out my existing hard-drive, which contained several movie projects that I

had invested hundreds of hours creating. Of course, everything was backed up through Time Machine, but I was still worried.

I talked to as many people as I could find to learn from their experiences and I trolled the Internet for help and instructions. The folks at the Pi workshops were extremely helpful in relating experiences, giving hints, and suggesting places I could go to get more information.

I found the Internet extremely helpful. From various links, Apple forums, and videos, I learned that there were at least six ways of upgrading to an SSD. I chose the one that I thought was the safest, which involved first removing the existing hard-drive and installing the SSD, then installing the latest version of the operating system, and finally using Time Machine to do the restore. I really liked that approach because once I removed the old drive and carefully put it away I could always reinstall it if I messed up. I figured that at the very least everything would be as it was before I started. As it turned out, this method was also the most economical. It required no special wiring kits, hard-drive enclosures, cloning software, or other items some methods required; the only

thing I needed was a couple of special screwdrivers that cost a few dollars each.

In my Internet searches, I learned about something called TRIM, which optimizes SSD performance by deleting un-needed blocks of data. TRIM comes configured with the new Apple-installed SSDs but needs to be installed for non-Apple drive upgrades. I found a site where TRIM was available for free and downloaded it. It wasn't clear to me if it would work with all brands of SSD's, but I hoped so.

Now I was almost ready. All I needed was a new solid-state drive, a bootable thumb drive with the latest operating system on it, and the screwdrivers. I learned that the thumb drive had to have a capacity of at least 8 GB, as the operating system took up more than 4 GB. Fortunately, I had a brand new one on hand, but I didn't know how to install a bootable OS on it. For this, the Internet came to the rescue again. I bought the screwdrivers at the Microcenter. They are also available at Home Depot.

I checked with Amazon, MacSales, MacMall, Apple and others on availability and prices of 500 GB SSD's. As it turned out, Amazon had just put a Scandisk

drive on sale for \$300, significantly less than other drives I found. The next step involved watching "how-to-do-it" videos and printing out instructions to have on hand for reference during the "operation." I also had an iPad on-line tuned to the "how-to" videos so I could watch them while I was installing the SSD.

Several sites from MacSales were wonderful in providing step-by-step instructions and videos, as was material from Apple discussion forums. However, the instructions I liked the best were from a Sakitech site on Youtube. One site demonstrated step-by-step how to open the computer, install the drive, install the operating system and then do the restore from Time Machine. The other site demonstrated how to make a bootable thumb drive. I have provided the URLs at the end of this article.

The Results

Did things turn out OK? Were there any surprises or glitches along the way? The answers are yes and yes!

1. My computer now boots up from off to fully on in about 20 seconds!
2. Applications open almost instantly.

3. The data rate of the SSD is 6 Gb/s but limitations imposed by the SATA bus in the computer limits it to 3Gb/s. This is still twice the data rate of 1.5 Gb/s I got with the original 5400 RPM hard-drive.
4. After I installed the TRIM package downloaded from the Internet, the computer responded by saying it was installed successfully. From this I presume that this version of TRIM is universal and will likely work with all brands of SSDs.
5. A few surprises occurred during the Time Machine restore process. Roughly three hours in, the little blue progress line shown on the screen said there was about a minute left to complete. This "1 minute" remained unchanged for another three hours, I became concerned that the computer had hung up, so I stopped the process and started it all over again. Yes, of course, I got the same result the second time! So, don't believe the progress bar. It took overnight for all the applications, files, data, and settings to be restored.
6. A critical step before starting the restore process is to make sure that the Time Machine app is turned on in the computer. This is covered in the

demonstration video referenced above but easily overlooked. Also, make sure that your Time Machine hard-drive is not full beyond capacity. Mine was, and it may have contributed to a problem I describe below.

7. Restoring from Time Machine is accomplished using a migration application located in your computer under Utilities. This is all explained in the demo video referenced above.

What happens is that the Time Machine data are restored to a new user. You are presented with a drop-down box to enter a name for this user. You probably should pick a name similar to but not the same as your old one. The restored system has administrator privileges with the same password as before.

When the restoration is complete and you turn on the computer from a cold start you will have three users: The new one you just created, the one with your original user name and a Guest. The one with your original user name is pristine. It doesn't have any applications or data. It's like what you

would find when the computer is brand new. It has administrator privileges too. You can remove this user if you wish, but it may be beneficial to have it available for troubleshooting.

If you've done everything right, the new user you created will have all the applications and material that you had on the old hard-drive. (As an aside, I would presume that if you used the "clone" process for upgrading to an SSD, you would not get the new user.)

8. After I installed the new SSD, I moved all of my *iTunes* and movie files from the external "media" drive to the new internal drive. This step accomplished my goal of not having extra external equipment to carry around. I made the 1TB drive that had hosted the media my new Time Machine backup. Of course I erased it and reformatted it for that purpose.
9. As I mentioned above, I ran into a bit of a problem. I'm not sure of the cause. It may have been because my Time Machine drive was overloaded or because I started and aborted the restore process a couple of times. At any

rate, what happened was the new SSD got nearly filled with back-ups leaving little room for anything else. Searching Apple Forums led to a site that said back-ups could be removed by entering a special phrase into the Terminal app under Utilities. Wow, opening the computer was stressful enough, but now I had to do Unix editing. Oh well, this was the reason I carefully stored the old drive away! I entered the phrase, closed my eyes, crossed my fingers and pushed the Go button. Thankfully, it worked! I hope you don't run into this problem, but if you do the magical phrase is `sudo tutil disablelocal`.

How-to-do-it References:

1. Sakitech – How to Upgrade your MacBook Pro to a SSD
<http://www.youtube.com/watch?v=jBgjnlv0a7w>
2. Upgrading your MacBook Pro with a SSD
<https://discussions.apple.com/docs/DOC-4741>
3. Sakitech –How to create a Bootable Mountain Lion OS X 10.8 USB Flash Drive
<http://www.youtube.com/watch?feature=endscreen&NR=1&v=plnSJrUGEyw>
4. Migrating Your MAC OS X Installation to a New Drive
<http://eshop.macsales.com/articles/how-to-transfer-your-data-from-your-old-drive-to-a-new-drive>
5. Unibody MacBook Pro Q & A
http://www.everymac.com/systems/apple/macbook_pro/macbook-pro-unibody-faq/macbook-pro-13-15-17-mid-2009-how-to-upgrade-hard-drive-ssd.html
6. Remove unwanted back-ups (See last entry)
<http://forums.macrumors.com/showthread.php?t=1302146>
7. TRIM Enabler
<http://www.groths.org/trim-enabler/>

FunBITS: Blackbar Offers Trenchant Word Puzzle

Josh Centers

It's a scary time to be an American. After the revelations of ██████ ██████████, we know that our post-9/11 security state is out of ██████████. The ██████ is spying on all of us, [backed by a secret ██████████](#) that's headed by none other than the Chief Justice of the Supreme Court. [Congress seems too frightened](#) to discuss it, much less take action. Our president seemingly wants to try to make us feel better about it, despite new ██████████ reported regularly. And on top of it all, the review board set up to reform the NSA is [packed with intelligence insiders](#).

On the bright side, developers Neven Mrgan and James Moore have taken advantage of the situation to create an innovative new word puzzle called [Blackbar](#). The game costs \$2.99 in the [App Store](#) and is universal for both iPhone and iPad.

The best way to describe Blackbar is that it's an ongoing crossword puzzle with a dystopian storyline. The game consists of a series of messages exchanged between Vi and her best friend, Kenty. Kenty has just taken a job with the Department of Communication. She's in trouble, but doesn't know it yet. (See Figure 1).

Parts of the letters Kenty sends to Vi are redacted by the Department, and you have to fill in the blanks using context clues and guesswork. As the story unfolds, you'll have to work out coded messages and even math puzzles to decipher what Kenty is saying. Fair warning: Kenty gets pretty frustrated at some points, and you'll have to decode some foul language.

Dear Vi,

I finally got a spare minute to write to you like I promised I would. Phew, moving to the big city was a LOT of work. Everything went well, though--can't complain. I'll have time to write a bit more after my job training etc. is over. Oh, just so you know, all my messages have to go through the Department of Communication first, so some of my writing may be ██████████.

Bye Now!

Kenty

Dear Vi,

I think I'm finally fully unpacked and ready to start my first Real Job! Exciting! Ok, so let me tell you a bit about where I'm living right now. It's a studio apartment, provided by the Department. It's not too far from work. The place is **small** but charming, as they say. These ██████ buildings have so much character! Bookshelves on every wall, lots of hidden closets and cupboards and built-ins. Very "efficient". That said, the truth is, I'll probably be spending most of my time in the office. I want to make a good first impression--teacher's pet and all that.

Thanks for your letter. Unfortunately, the bit about my mom got ██████████. No worries, I'm sure I'll find out what it was somehow.

Figure 1.

In the story, you'll also be contacted by a number of third parties — warnings from the Department, advisories from Your Neighborhood Board, and a mysterious "friend" who signs letters with only a Patriarchal Cross. These last messages can be particularly tough to decode, since your "friend" deliberately misspells words. (See Figure 2).

DeAR StRANgER AnD FRIEnD,

yOU don't knOW uS and we
DOn't KNOW you, But all OF us
kNoW K. wE KNOW K. IS IN
TRoUble, BUt K. DOESn't KNOW
It. yOU KNOW IT nOW THAt
wE've Told YOU, buT yOu can't
TEll K. buT yOu CAN HeLp her,
And we CAN heLp YOU help HER.

fROM nOW oN, say NoTHiNg
CoNtROVERSiAl, nEgATIVE, oR
SpEcIfIc/dETAILED In YoUR
LETTErS To K. Be blANd and
SuNny AND MilQUEToaST.

thE dEpartMENT KnOws, thOUGh
TheY DOn'T KNOW EvERYthing.
And THough YOU Don'T know
evERYthing eITHER, aT leAst
nOw, yOU KNOW.



Previous

Next



TO: VI CHANNI
FROM: DEPARTMENT OF
COMMUNICATION

MS. CHANNI, IT IS OUR DUTY TO
INFORM YOU THAT YOUR
CORRESPONDENCE WITH MS.
KENTERY JO LOAZ HAS RECENTLY
COME TO OUR ATTENTION DUE TO
THE UNUSUALLY HIGH NUMBER OF
WORDS REQUIRING ATTENTION
FROM THE COMMUNICATION
OFFICERS DELEGATED TO
AUDITING AND SANITIZING IN
YOUR NEIGHBORHOOD. WE
STRONGLY URGE YOU TO REFRAIN
FROM COMMUNICATING
UNDESIRABLE PHRASES IN THE
FUTURE. PLEASE BRING YOUR
COMMUNICATIONS IN LINE WITH
SOCIALLY ACCEPTABLE STANDARDS
OF DECENT AND APPROPRIATE
MESSAGING.

I like the style of the game, which has a retro feel. The messages look typewritten, with black Courier text on a white background. When you successfully figure out what a word is supposed to be, it's highlighted in yellow. Plain black graphics add to the look.

So if you're looking for a challenging puzzler that makes a unique statement, check out Blackbar. And if you're worried about maintaining your [REDACTED] (and you should be!), then check out Joe Kissell's latest Take Control book: [Take Control of Your Online \[REDACTED\]](#).

MR. CENTERS, OUR COMMUNICATIONS OFFICERS DETECTED AN ATTEMPT AT LINKING TO INAPPROPRIATE MATERIALS IN THIS ARTICLE. FOR YOUR SAFETY AND CONVENIENCE, WE HAVE SANITIZED THE ARTICLE TO THE BEST OF OUR ABILITY. YOU ARE WELCOME.

PLEASE REFRAIN FROM PUBLISHING UNSUITABLE COMMUNICATIONS IN THE FUTURE.

ॐ #19445

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Figure 2.

There are contextual clues in the text of the messages, and you can flip back to earlier messages for additional clues, but sometimes it just isn't enough. If I had one feature request, it would be some way to get extra hints in the game, without resorting to a [cheat guide](#).

Testing Google's Chromecast for Apple Users

Josh Centers

The Apple TV is Apple's most underrated device, and I would argue, one of the most important for the company's future direction. For many of us, the small black box is what ties the Apple ecosystem together — turning an iPhone into a home entertainment powerhouse while simultaneously encouraging investment in proprietary *iTunes* content. That's why I was so intrigued when Google announced the [Chromecast](#) [1] last week. Unlike the company's previous Google TV efforts, which were expensive, complicated, and kludgy, the Chromecast is a \$35 HDMI dongle that does nothing on its own. Instead, it relies on the Chrome Web browser and compatible apps to "cast" content to it — a bit like Apple's AirPlay.

I was fascinated by the device and ordered one immediately. Good thing, too, as it quickly sold out, and the included three months of Netflix that Google touted as an indefinite deal was yanked the next day due to the overwhelming response. Full credit to Google, they upheld their promise and sent me the Netflix promo code. (See Figure 1).

The packaging for the Chromecast is remarkably Apple-like. Once you slide the box out of its blue and white sleeve, it folds open to reveal the device; underneath is an HDMI extension cable, a micro USB cable, and a USB power adapter. (See Figure 2).

The Chromecast itself is tiny, measuring less than 3 inches (7.6 cm) long. On one side is the HDMI plug, which you insert into your TV. On the other is a power



Figure 1



Figure 2

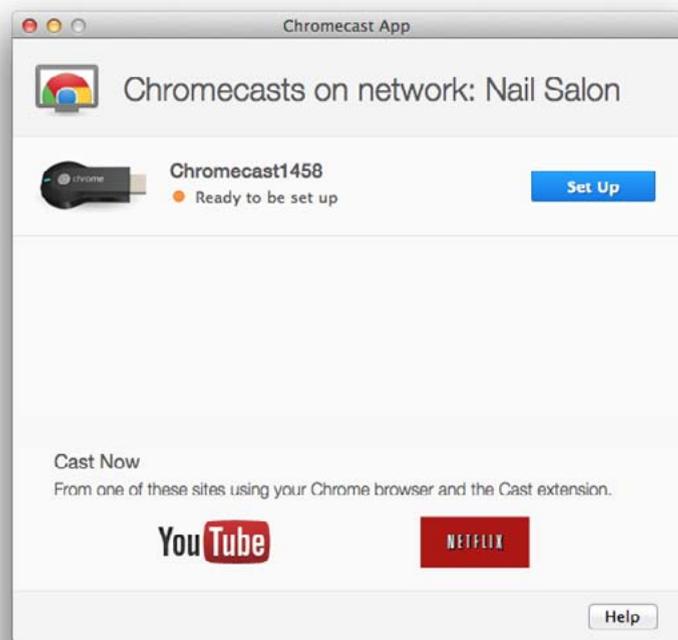


Figure 3

light, a button that resets the device to factory defaults if held down for 25 seconds, and a micro USB port that's necessary for power. You plug the included micro USB cable into the Chromecast, and then into either a powered USB port on the TV, if one exists, or into the included USB power adapter. My Sharp television didn't provide power on the USB port, so I had to use the power adapter. (See Figures 3 and 4).

One port that is notably absent is optical audio. So if you're like me and own an older home theater receiver without HDMI, you're stuck with whatever audio is available from your TV. Also, unlike the

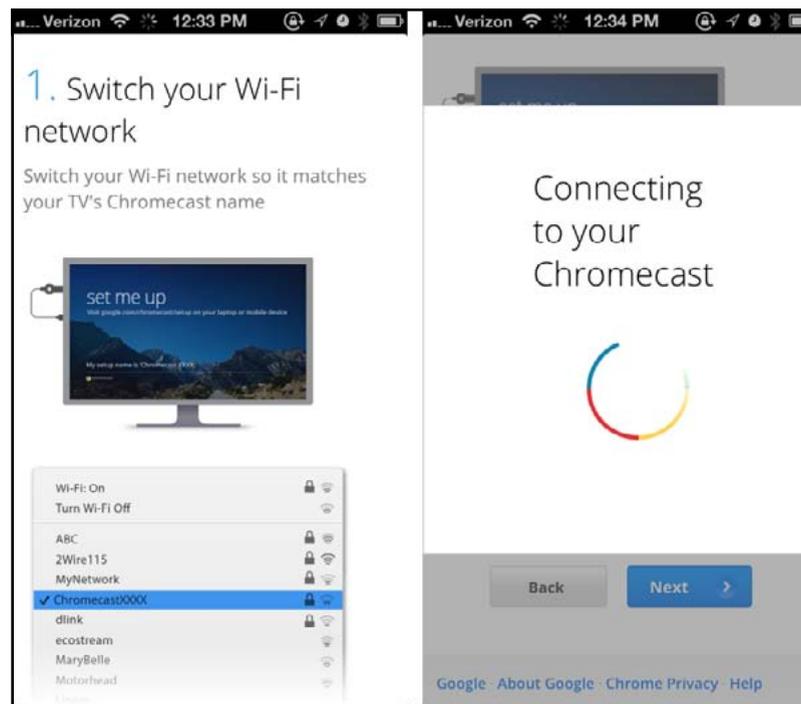


Figure 4

Apple TV, which can send audio to any AirPlay-enabled receiver, the Chromecast can't wirelessly send audio to another device.

Once you have the Chromecast plugged in and powered, switch your TV to the correct input to start setup. Visit the [Chromecast Setup page](#) [4] on an iPhone, iPad, or Mac to begin. I recommend setting it up via the Mac, as Google has provided a native Mac application (click the Download button) that makes setup practically automatic — it can even pull your Wi-Fi password from your Mac's keychain. I originally set mine up with an iPhone, which was also fairly painless, though I had to disconnect from

my AirPort base station and manually connect to the Chromecast over Wi-Fi. Don't panic, as this step is only temporary. Just open the Settings app, tap Wi-Fi, and select the Chromecast network. After setup is complete, go back into Settings > Wi-Fi and reconnect to your current network, which should take only a few taps.

With the Chromecast set up, it's ready to receive video from compatible applications, which so far include only Chrome on the Mac, Windows, or Chrome OS; Netflix for iOS; and YouTube for iOS. You cannot currently cast tabs from Chrome for iOS. However, Pandora, Vimeo, and HBO GO are reportedly working on Chromecast support, and any developer can use the [Google Cast software development kit](#) [7] to add support to an app. Certain Web apps, such as YouTube, also include direct Chromecast support. If you own an Android device, you can also cast Google Play content to the Chromecast. (See Figure 5).

In any Chromecast-enabled app, you just have to tap the Chromecast button, which is a rectangle with curved lines in the lower-right corner, to send content to the TV. To enable this in Chrome on the

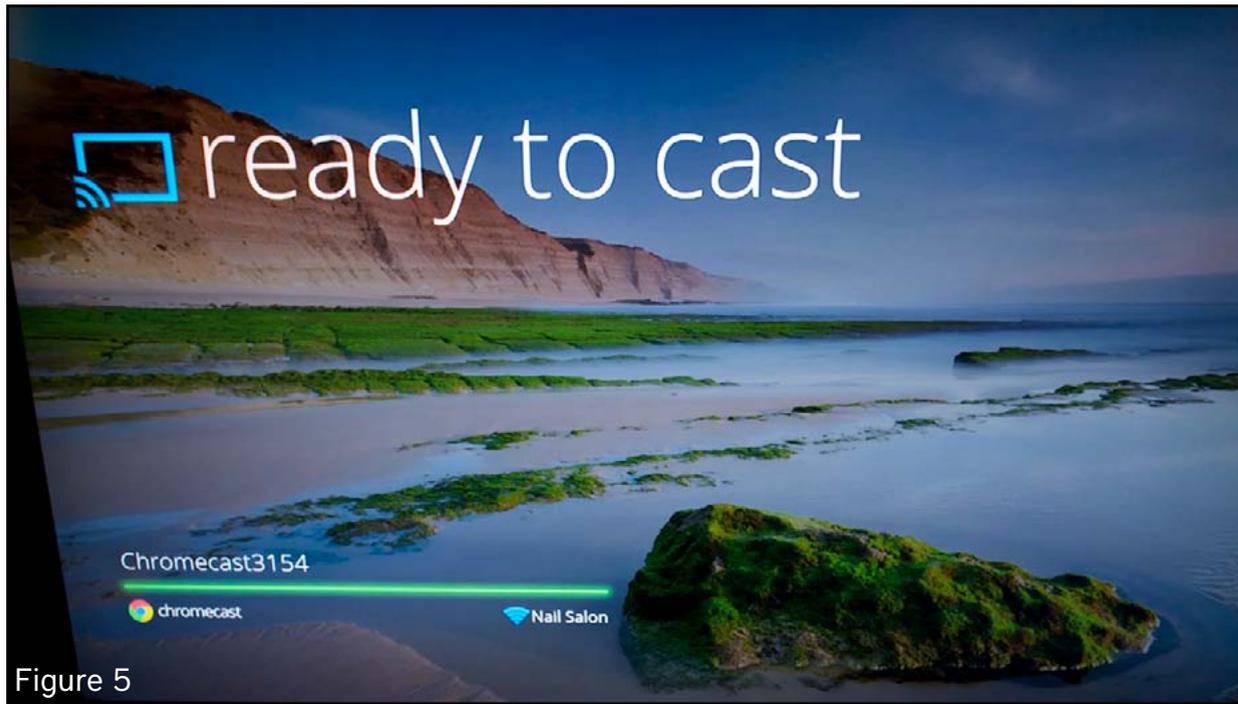


Figure 5

Mac, you must first [install the Google Cast extension](#) [9], a step that Google seems to have glossed over in the instructions. (See Figure 6).

I should note here that the Chromecast's "casting" is different in a key way from AirPlay. While AirPlay sends audio and video directly from your device to the Apple TV, Chromecast-enabled apps send only a URL, which the Chromecast loads through its own built-in Web browser. Also, unlike the Apple TV, the Chromecast does not have a hardware remote. You control the audio or video directly on your device, including volume. The Netflix iOS app even activates a remote mode when it sends video to the Chromecast. (See Figure 7).

This simplified approach has advantages and disadvantages when compared to Apple's method. It does eliminate some confusion. When using AirPlay, it can be difficult to predict what will happen if you send the app to the background, put the device to sleep, or try to control your content with the remote control.

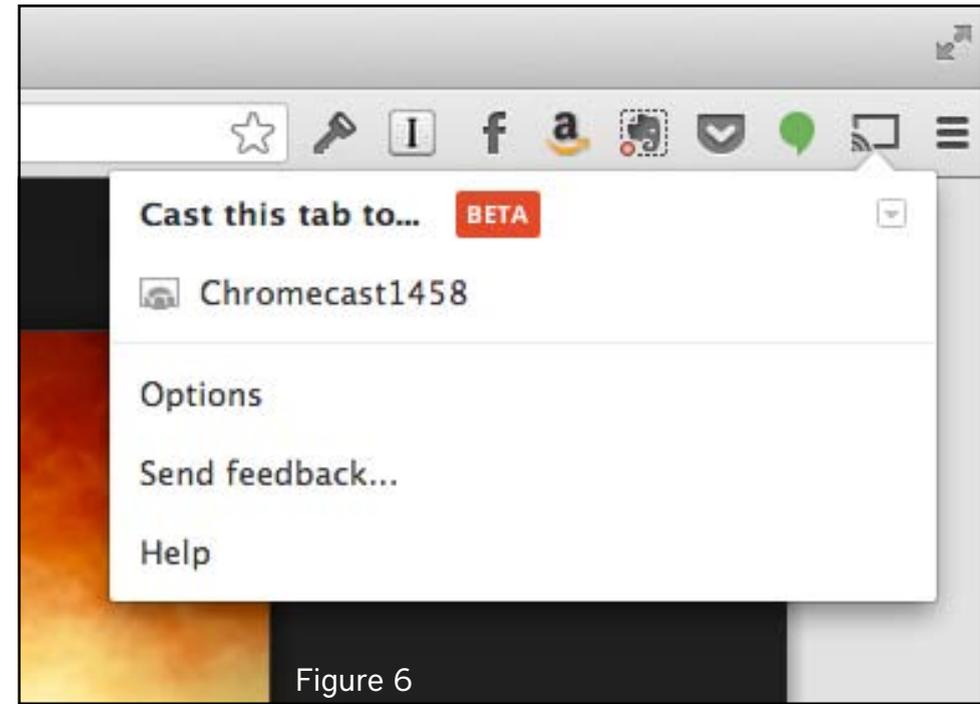


Figure 6



Figure 7

On the Chromecast, you don't have to worry about switching away from the Netflix app, because the Chromecast is processing the video independent of the device. However, if you need to pause or stop the video, or turn down the volume, you might find yourself fumbling to get back to the app, instead of just picking up a remote.

The other big disadvantage is that video looks worse on Chromecast than on Apple TV. It often takes longer to load, appears fuzzy for a bit, and then sharpens into HD quality. But even at its best, the video quality looks hazy, like a fine film of petroleum jelly has been smeared over it. Audio quality also sounds poor compared to Apple TV, but since I can't use the Chromecast with my home theater speakers, it could just be my TV's lousy speakers.

While I didn't notice any sort of burn-in protection on the Chromecast, TidBITS reader Garrett White made a [time-lapse video](#) [12], spanning the course of 20 minutes, showing how the Chromecast slowly shifts screen elements to prevent burn-in. Despite improvements in screen technologies, burn-in, where a fixed image becomes permanently etched into the screen, is [still a problem](#) [13] on many displays.

The nice thing about the Chromecast is that with the Google Cast Chrome extension, you can send any browser tab to your TV. Even if you switch between apps and tabs on your Mac, the same tab remains on the TV. In some ways, this is better than OS X 10.8 Mountain Lion's desktop mirroring, since you can continue to work on your Mac while you stream content to the TV. If you like to watch content from Flash-based Web sites, the Chromecast could be a great addition

to your home entertainment system. Also, you can view [Hulu](#) [14] content on your TV without a Hulu Plus subscription, but since each video opens in a new tab, prepare for lots of micromanagement.

Curious to push the Chromecast to its limits, I decided to try to play a game of [Roll It](#) [15], Google Chrome's experimental skee ball game (for more on that, see "[FunBITS: Motion Control Games on Your iPhone](#) [16]," 26 July 2013), on the Chromecast. Since it was released days before the Chromecast, I figured it was meant to be played on a TV. Unfortunately, there is about two seconds of lag between what happens in Chrome and what appears on your TV screen, making gaming nigh impossible. In comparison, AirPlay-enabled games usually work quite well on the Apple TV.

Considering that the Chromecast's \$35 price is roughly a third of the Apple TV's \$99 cost, you get what you pay for. I can say that for me, the Chromecast will not be a fixture in my living room. The lack of optical audio kills it for me, as well as the current paucity of apps and crippling lag for games. However, if you own Android devices or are curious about digital content on your TV, the Chromecast is an inexpensive way to dive in — once Google has more in stock.

If you're in business or education, you might be tempted by the Chromecast for presentations, but I would recommend the Apple TV instead. While you can password-protect AirPlay on an Apple TV, there is no such capability on the Chromecast. For a high school teacher, the Chromecast is wide open to a potentially career-limiting prank.

While the Chromecast is not currently a threat to the Apple TV, Apple would be foolish to ignore it. Google is working hard to bring content providers on board, and I suspect they will join at a breakneck pace. Just as I think the Apple TV is key to Apple's future, the Chromecast might, in the long run, prove equivalently important to Google's.

- [1]: <http://www.google.com/intl/en/chrome/devices/chromecast/>
- [2]: <http://tidbits.com/resources/2013-07/Chromecast-box.png>
- [3]: <http://tidbits.com/resources/2013-07/Chromecast-size.png>
- [4]: <https://cast.google.com/chromecast/setup>
- [5]: <http://tidbits.com/resources/2013-07/Chromecast-Mac-setup.png>
- [6]: <http://tidbits.com/resources/2013-07/Chromecast-iPhone-setup.png>
- [7]: <https://developers.google.com/cast/>
- [8]: <http://tidbits.com/resources/2013-07/Chromecast-ready.png>
- [9]: <https://chrome.google.com/webstore/detail/google-cast/boadgeojelhgndaghljhdicfkmlpafd>
- [10]: <http://tidbits.com/resources/2013-07/Chrome-Mac-Chromecast-button.png>
- [11]: <http://tidbits.com/resources/2013-07/Chromecast-Netflix-iPad-remote.png>
- [12]: <http://www.youtube.com/watch?v=Y40IRjkF9XY>
- [13]: <http://lifehacker.com/5982108/is-burn+in-still-an-issue-on-tvs-and-monitors>
- [14]: <http://www.hulu.com>
- [15]: <http://chrome.com/campaigns/rollit> [16]: <http://tidbits.com/article/13962>

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The Evolution of Technology in the Classroom

David Rabinowitz

My parents' classrooms were similar to those that their parents sat in every day. Both were filled with books, pencils, notebooks, and chalkboards, and what technology existed — overhead projectors starting in the 1960s, TVs and VCRs in the 1980s — was the exclusive province of the AV Club. Thankfully, those items are slowly being pushed out of classrooms in favor of newer and more interactive technology. But if you haven't set foot in a classroom for years, you might think that educational technology still means desktop computers. They're still commonplace, but newer and more sophisticated devices are also gaining ground.

A Personal Tour of Educational Technology — Graduating from the University of Virginia this spring caused me to think back on both my time in school and the technology that accompanied me. It all started with desktop computers in the late 1990s — Macs running Netscape Navigator in my elementary school's computer lab. Those now-quaint machines have since been replaced with much more modern PCs, and my old elementary school now even boasts [an assortment of iPads and laptops](#) [1].

What we did with those computers was, frankly, a little lame. In third grade, along with learning cursive, we learned typing, although I never had to type any further assignments in elementary school. Now, [many schools are opting to teach only typing](#) [2] and forgo cursive altogether. Given how little I find myself needing to write by hand now — much less in cursive — I don't find this emphasis on typing troubling.

Technology became a more significant aspect of education in high school. Toward the end of my time at [South Lakes High School](#) [3] (Fairfax County, Virginia) from 2005 to 2009, [a \\$50 million renovation](#) [4] resulted in a school that was outfitted with the latest and greatest technology. Every classroom gained a digital LCD projector that could be hooked to the teacher's laptop and used in conjunction with a [document camera](#) [5] to display whatever was on the teacher's desk on a screen at the front of the classroom. Many rooms also got [SMART Boards](#), which are interactive, touch-sensitive replacements for chalkboards, making it possible for teachers and students to drag and manipulate the images projected on the board. Since then, SMART Boards have become popular, and [every school in Fairfax County](#) [6] is installing them.

My fondest memory of SMART Boards came during high school geometry. The teacher was explaining some of the rules and formulas that apply to triangles and circles. He taught us how we could figure out the size of a triangle that would fit perfectly inside a circle of a particular diameter. To demonstrate his point, he drew a triangle on the SMART Board and then dragged it inside the circle. To everyone's amazement, it fit perfectly! Before SMART Boards, the teacher would have just told us that the triangle would fit or would have had to redraw it inside the circle.

Although many teachers used their SMART Boards, not all were enthused about them. One of my math teachers just used it as a surface to shine the projector on. Once, she even used a marker on it, instead of the digital writing pen, leaving a permanent stain.

South Lakes High School now has a ratio of 1 computer for every 1.6 students. Students can even [bring in their own laptops or tablets](#) [7] if they get parental consent. Laptops are starting to replace desktops, and now there are even laptop trolleys students can borrow from. Currently, “a fair number” of students bring their own laptops, according to McNeill Bauer, a South Lakes High School senior. He said that it depends on the class and teacher how much the laptops are used, and said that “at least 50 percent of people in my history class use laptops, but nobody does in math.” Just as I discovered in college, having a laptop available in class is better suited to some subjects — and some teachers — than others.

As I mentioned in a previous article (see “[Living through the Evolution of Etextbooks](#) [8],” 5 April 2013), technology has become ubiquitous in college. Almost every student has a laptop and some are starting to bring tablets to class, as you might expect.

But one commonplace gadget that few outside of academia have seen is the [iClicker](#) [9], which resembles a TV remote and lets instructors poll the class directly. The iClicker has five buttons, each corresponding to an answer, and when the professor asks a question, iClicker-wielding students respond by pushing a button. Responses are received by an [iClicker Base](#) [10] at the front of the room — it uses the 900 MHz spectrum to avoid interfering with Wi-Fi. Along with providing professors an easy way to quiz students on the topic at hand, iClickers are the bane of any student who blows off class, since they serve as an instantaneous way to take attendance and determine who’s paying attention. (See Figure 1 – [image link](#) [11])



Figure 1.

The most compelling technology I used in college was the [experiment](#) [12] feature in a course management system called [Aplia](#) [13]. In addition to managing homework through Aplia, the professor could launch an experiment during class. Since this was a microeconomics course with over 600 students, it was the perfect environment.

One day, the professor asked us to bring our laptops in order to participate in a demonstration of the effects of [price ceilings](#) [14] and [price floors](#) [15]. Through the Aplia Web site, everyone was assigned to be either a buyer or seller in a simulated market for used textbooks. Each student was also assigned a different dollar amount at which they valued the textbook. When the virtual market was opened, people were free to make bids and offers. It was fascinating to see, in real time, the supply and demand curves slope toward each other and eventually meet at an equilibrium. The demonstration showed that in a controlled environment, when people are self-interested and rational, the market usually behaves in predictable ways. Aplia offers other economics experiments, like one

illustrating the tragedy of the commons, and all experiments can be demoed on [the company's Web site](#) [16] (click Go To Demo). (See Figure 2 – image link [17]).

Less successful was another in-class technology called [Class Spot](#) [18], which is essentially a way to let students share their screens with the entire class, and to collaborate by controlling a shared screen, called the “teaching wall.” The professor controls who can be on the screen at the same time, and can even lock the teaching wall to regain control over the class. The idea is great in theory, but the system was buggy and suffered from significant lag — a particular irony in a senior-level computer science class. Plus, the Class Spot client software was difficult to install, and, at the time, wasn't even compatible with OS X 10.8 Mountain Lion, which I was running on my MacBook Air. After a few minutes of use from those who could get it to work at all, the professor shut down Class Spot and continued the lecture. We never used it again, but I hope future classes give it a try and have a better experience.

The iPad in Education — One piece of technology that never came up during my years in school was the iPad, which has made significant inroads in primary schools over the last few years. [Frasier Speirs](#) [19], an education consultant and head of IT at the [Cedars School of Excellence in Scotland](#) [20], is a pioneer in the field. He is also an [Apple Distinguished Educator](#) [21] who gives presentations about implementing technology in education.

Under his direction, the Cedars School of Excellence bought and distributed iPads for all 120 students and teachers in the school. Although the school is small, the experiment has had such promising results that the school later

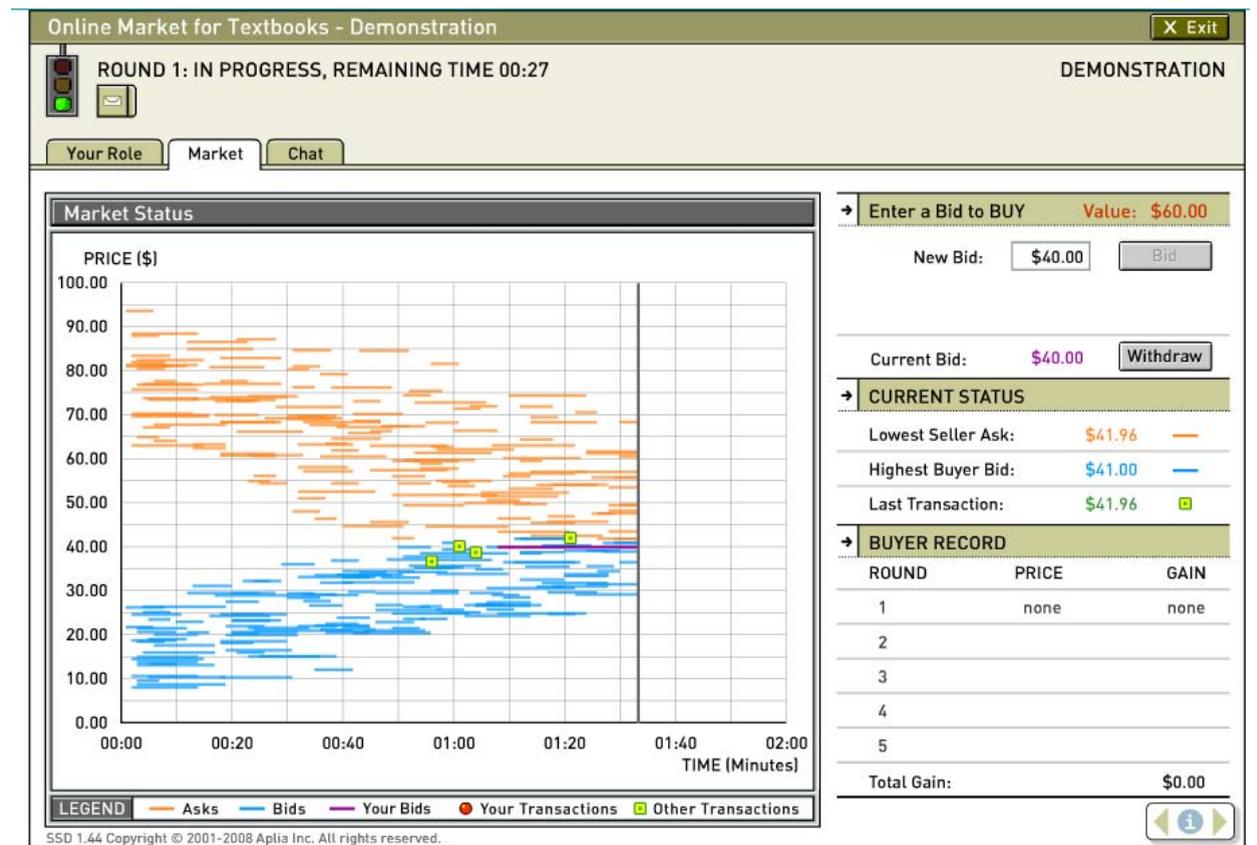


Figure 2.

adopted *iTunes U* as the digital learning platform for both creating their own courses and using other private *iTunes U* courses in class. Although *iTunes U* was initially embedded within *iTunes*, there's now an [iTunes U app](#) [22] for iOS. Through the *iTunes U* app, teachers can distribute their own text, audio, video, and presentations, or material from educators around the world. *iTunes U* also integrates with iBooks for textual material, enabling students to highlight important passages and take notes with course materials.

According to Speirs, *iTunes U* “helped a segment of the student population get better organised with their homework, and submission rates have gone up... [and] students vastly prefer courses that embed the content right in it.” He said

that overall, the *iTunes U* initiative has gone well and that the school will most likely continue it in the future, with a few modifications, like making content, “more ‘native’ to *iTunes U*, rather than taking what we have in PDF files and Keynotes and dumping it into *iTunes U*.”

The launch of the iPad came just at the right time for Speirs and the Cedars School of Excellence. Months before its announcement, they were toying with the idea of buying every student an iPod touch. They needed more computers to satisfy the demand for increased classroom technology use and wanted each student to have a computer. The iPad satisfied the need for a student-focused computer and fit perfectly between an iPod touch and a MacBook.

And, yes, Speirs is adamant that the iPad is a computer, and disagrees with the notion that it is merely a content-consumption device. He points to a number of uses in his school, from taking notes to drawing, that prove the iPad can be used to create.

When asked about the overall success of the iPad deployment, he said, “The initiative has been very successful. We are now three years into it and it is progressing well. We have seen a real cultural change around computing in schools, where once the use of a computer or the Internet was something special, it’s now commonplace for us.”

[Bradley Chambers](#) [23], Fraser Speirs’s co-host of the [Out of School podcast](#) [24] about the intersection of technology in education and Director of IT at the [Brainerd Baptist School](#) [25] in Tennessee, is also a proponent of iPads in education.

“From a hardware perspective, the iPad (and iOS) have removed the barriers of computing for the average person,” said Chambers. He prefers the iPad over laptops, saying that PCs and Macs are complicated devices that are easy to break. Although the Brainerd Baptist School doesn’t have the 1-to-1 iPad to student ratio enjoyed by the Cedars School for Excellence, with 81 iPads for 305 students, the school still uses them in interesting and non-obvious ways. For example first-grade students used them last year to scan QR codes around the school that triggered animal noises.

What about the fragility of the iPad? Considering that they cost about five times what a regular textbook costs, the iPads need to be able to stand up to years of use, and, given that we’re talking about K-12 schools here, abuse. The iPads at Speirs’s school are indeed holding up well. In fact, they are still using original iPads that are almost 3 years old! Despite the iPads being handed even to kindergarteners, the school’s breakage rate is only about 3 percent per year, and the only protection the iPads get is the original Apple iPad case.

Even apart from *iTunes U*, Apple is pushing hard on [moving the iPad into education](#) [26], emphasizing software such as [iBooks Author](#) [27] for creating course content and technologies like [AirPlay](#) [28] for putting class materials on the big screen. And, of course, there are innumerable apps designed for education — the hardest part for teachers is probably figuring out which are worthwhile and can be integrated into a curriculum. On the management side, Apple also makes [Apple Configurator](#) [29], a Mac app that makes it easy to configure and deploy iOS devices in institutions like schools, simplifying the process of changing settings, updating the OS, and installing apps on multiple connected devices at once.

But not all that's necessary can come from the private sector — increasingly, these devices are nearly useless without a fast and reliable Internet connection, something that's far from ubiquitous in K-12 schools, and particularly those in lower-income areas. The [United States famously trails behind](#) [30] a number of other countries in terms of high-speed Internet access, and to remedy this, President Obama recently unveiled the [ConnectedEd](#) [31] initiative, which has the ambitious goal of bringing high-speed Internet access to 99 percent of students within five

- [1]: <http://www.fcps.edu/SunriseValleyES/tech/technew.htm>
- [2]: <http://www.cnn.com/2011/IREPORT/08/24/cursive.writing.irpt/>
- [3]: <http://www.fcps.edu/SouthLakesHS/>
- [4]: <http://www.connectionnewspapers.com/news/2004/jan/21/south-lakes-renovation-moves-ahead/>
- [5]: <http://smarttech.com/doccam>
- [6]: http://www.setda.org/c/document_library/get_file?folderId=229&name=DLFE-207.pdf
- [7]: http://www.fcps.edu/SouthLakesHS/resources_assets/PersonalNetworkDevice_PermissionForm.pdf
- [8]: <http://tidbits.com/article/13685>
- [9]: <http://www.iclicker.com/>
- [10]: <http://www.iclicker.com/student-response-system-receiver>
- [11]: <http://tidbits.com/resources/2013-07/iclicker.jpg>
- [12]: <http://www.aplia.com/experiments/>
- [13]: <http://www.aplia.com/>
- [14]: https://en.wikipedia.org/wiki/Price_ceiling
- [15]: https://en.wikipedia.org/wiki/Price_floor
- [16]: <http://www.aplia.com/experiments/>
- [17]: <http://tidbits.com/resources/2013-07/Aplia-experiment.png>

years. The initiative will also support training teachers to use new technology and will encourage private-sector investment, although specific details remain fuzzy. Nonetheless, the fact that the White House is devoting attention to the topic of educational technology bodes well for improvements in schools whose budgets have not provided the kind of support I saw throughout my K-12 schooling, or that exists in private schools like those that employ Frasier Speirs and Bradley Chambers.

- [18]: <http://tidebreak.com/products/classspot>
- [19]: <http://fraserspeirs.com/>
- [20]: <http://cedars.inverclyde.sch.uk/>
- [21]: <http://www.apple.com/education/apple-distinguished-educator/>
- [22]: <https://itunes.apple.com/us/app/itunes-u/id490217893?mt=8>
- [23]: <http://chambersdaily.com/>
- [24]: <http://www.outofschool.net/>
- [25]: <http://www.brainerdbaptistschool.org/>
- [26]: <http://www.apple.com/education/ipad/>
- [27]: <http://www.apple.com/ibooks-author/>
- [28]: <http://www.apple.com/airplay/>
- [29]: <https://itunes.apple.com/us/app/apple-configurator/id434433123?mt=12>
- [30]: <http://techcrunch.com/2013/04/23/akamai-average-u-s-internet-speed-up-28-yoy-now-at-7-4-mbps-but-south-korea-japan-and-hong-kong-still-far-ahead/>
- [31]: <http://www.whitehouse.gov/blog/2013/06/06/what-connected>

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Memory... all alone in the moonlight...



2 megabyte
Smartmedia card
from Apple
QuickTake 200,
1996
seven 300K photos



8 megabyte
Compact Flash
from Kodak
DC50, 1996
twenty
400K photos



256 megabyte
Secure Digital
card, 2004
128
2 MB photos



64 gigabyte
Secure Digital
SDXC card,
2013
2,800
24 MB photos

Washington Apple Pi Meetings

Entertainment Media and Apple Devices

October 26, 2013, 9:30 a.m., George Mason University

Apple makes a wide variety of hardware and software designed to do everything from play music to show TV programs on your iPod, iPad, iPhone, Apple TV, or Mac laptop or desktop machine. But do you know how *iRadio* works? Or how to stream a movie, or watch HBO on your iPad when you aren't sitting at home in front of your TV?

Mike Wish, an Apple user since birth (or close enough) and former Apple Store Expert and Genius as well as current Apple Certified Support Professional, Apple Certified Mac Technician, Apple Certified Mobile Technician, etc., has spread the Apple message to 16 countries on four continents. He will dive into the world of melding entertainment media and Apple devices, and probably have answers to questions you don't even know how to ask.

The meeting will be held at our usual location, the Enterprise building, Room 178 on the George Mason University campus in Fairfax VA. Check back closer to the meeting date for any updates or changes.

Once again, we will attempt to stream it over the Internet:

<http://www.ustream.tv/channel/wap-general-meeting>.

Apple Update with Aaron Davis

November 24, 2013, 9:30 a.m., George Mason University

Aaron Davis of Apple will be the featured speaker November 24, updating Washington Apple Pi on whatever Apple happens to have released by that time. Possibilities include: new iPads, new Mac Pros, new MacBooks, new Mac minis, new Mac iMacs, new Apple TVs, maverick operating systems, wearable electronics, teleportation devices, superluminal transportation — we really don't know.

Aaron brings a wealth of experience and knowledge about all things Apple, so bring your questions about these things that we don't know anything about yet.

The November meeting will be held at our usual location, the Enterprise building, Room 178 on the George Mason University campus in Fairfax VA. Check back closer to the meeting date for any updates or changes.

Important notice: The main presentation by Aaron Davis will not be streamed live over the Internet. Only the earlier Q&A session will be available on the Pi's Ustream web page,

<http://www.ustream.tv/channel/wap-general-meeting>

As always, check the [Pi web site](#) for additional, updated details on these meetings.

Members Helping Members

Dedicated volunteers are the lifeblood of the Pi. Whether it is installing a hard drive at a Clubhouse Saturday event, answering questions at a General Meeting, or placing advice on the TCS Forums, there are many ways to pitch in and help, depending on a member's interests and talents. Please consider making a commitment to ensure that the Pi remains a strong and energetic club dedicated to helping its members. All volunteer efforts are appreciated. Check out these areas where assistance is needed.



Featured Position – General Meeting Webcast Director

The Pi currently captures its General Meetings on videotape for future viewing by members who cannot attend the meetings. Using the same camera, we are able to concurrently produce live webcasts so members can view the meeting in real time via the Internet. We need a dedicated volunteer to oversee the technical and production aspects of this webcast.

There are various technical components to putting up the video on the Pi's Ustream web page. The Webcast Director needs to ensure that the equipment is properly set up and functioning, and needs to monitor the audio and video streaming production from start to finish (or designate someone to do this) to ensure satisfactory audio and video quality. The Webcast Director will not be responsible for any other part of the General Meeting program, but will focus exclusively on the webcast production.

Any previous experience in TV or video production would be advantageous, but is not required. A basic understanding of video and audio equipment and how to connect them would be helpful, but the contracted cameraman has primary responsibility for equipment hookup. The Webcast Director needs to make sure that the meeting presenters do not stray from their predetermined stage positions, so they remain adequately illuminated for the entire presentation. Also, this person should be available in case of a technical or other problem that would require the speaker to temporarily suspend their presentation. Case in point: the Webcast Director will stop the action when the cameraman indicates that a new tape needs to be swapped out in the video camera.

If you are interested in helping out with an eye on taking over this important position, contact office@wap.org.

Journal Managing Editor

The *Journal* is an established, time-honored publication of the Washington Apple Pi and it is in need of someone to take over as Managing Editor, leading a team of dedicated and highly skilled volunteers. The *Journal* is published on a bi-monthly basis so most of the activity occurs in the three weeks leading up to the publication date. In addition, this person will be a member of the Pi's Publications Committee, which has oversight of all printed material published by the Pi. The job is challenging, but very rewarding.

If you enjoy writing and want to help the Pi progress, this is the job for you. If you enjoy working with enthusiastic colleagues on meaningful projects, apply today.

Contact the interim *Journal* editor, Jay Castillo, at: editor@wap.org with any questions or to express your interest.



General Meeting Manager

Our General Meeting programs need someone dedicated to the planning and managing of these important club events. The job includes coordinating meeting activities, making any necessary arrangements, and managing the behind-the-scenes tasks. While it sounds like a job for Superman, that really is not the case. If you have juggled household duties or been an office administrator, you have the skills. While another Pi manager emceeds the meeting, you will be making him or her look good!

Because this activity needs to be approved by the Pi's Management Committee, the volunteer will serve as an adjunct member of that committee. This volunteer opportunity is guaranteed to keep you busy, and when the meeting is over and everything is packed up, lunch is on the Pi.

Send your inquiries to office@wap.org to express interest and we'll go from there.

iChat Help Volunteer

Apple's *iChat* application offers a way for Pi members to help other members from the comfort of their own home. Interested? Read on.

iChat is an ideal means for direct communication using text, voice, video, or, in the last two versions of Mac OS X, screen sharing. With the Pi having commercial grade servers and server software, we now have the means to host our own *iChat* network. We are currently testing the capability of this interactive networking software, and the first results are positive.

So what will Pi *iChat* Help volunteers do? Basically, the volunteer helps members who have questions or a problem, but instead of meeting face-to-face, you handle the matter using *iChat*. What's that? You don't use *iChat* or haven't even launched it yet? No problem, we will train you. We will also be providing guidance on how to deal with common issues, and on problem-solving techniques, and will supply a list of associate helpers who can help with particular issues. All you need to bring to the equation is your people skills and a genuine desire to help.

If you have even the slightest interest or any questions, contact office@wap.org.

Washington Apple Pi

