

## Geophysics on an iPad?

Although not normally an early adopter of consumer electronic gadgets I eagerly registered for the release of Apple's 3G iPad (<http://www.apple.com/ipad/>) in May this year, hoping the tablet format would be of fundamental benefit to many aspects of my life. Has it lived up to the expectations? The answer is a qualified 'yes', although I believe the potential of the iPad remains fundamentally unrealised.

As widely promoted, the iPad is first and foremost a media consumption device. Provided that you are on a wireless network, the iPad is brilliant for reading e-mails and browsing the web. I also have an Optus pre-paid plan that provides 8 GB of data in a six month timeframe for \$80. Four months into the plan and I have only used a few hundred MB, so no problems with data costs. But the fundamental problem is that Australian iPad plans only work within Australia. Travel overseas, as I often do, and you either need a wireless network or a local pre-paid 3G SIM card. I have had a couple of initial challenges when hotel rooms offer no wireless access, so that means no e-mail and web access. The iPad has no ports for telephone or ethernet cables.

I had hoped that the iPad would become my preferred platform for giving presentations to clients, and it almost works. Indeed, I have survived overseas trips with nothing but my iPad, but I cheated by also taking a USB stick of files in case the only solution was a PC running Windows. Apple's VGA adapter cable is frustratingly short, about 20 cm, so it can be difficult to place the iPad (and thus you) far enough away from the LCD projector for comfort. The touch screen operating system has no concept of a cursor, so a bluetooth mouse is incompatible. A bluetooth keyboard, however, can provide minimalist control of presentations (once launched) from many metres away. A great challenge is that very few applications (or 'Apps') have video-out capability. Indeed, the only practical way to run PowerPoint presentations is to read PowerPoint files into Apple's Keynote App, which has greatly reduced functionality compared to the desktop version of Keynote, and then you are away. All types of file exchanges between the iPad and your desktop Apple or PC is done through the (free) iTunes platform. The iPad 25 cm screen



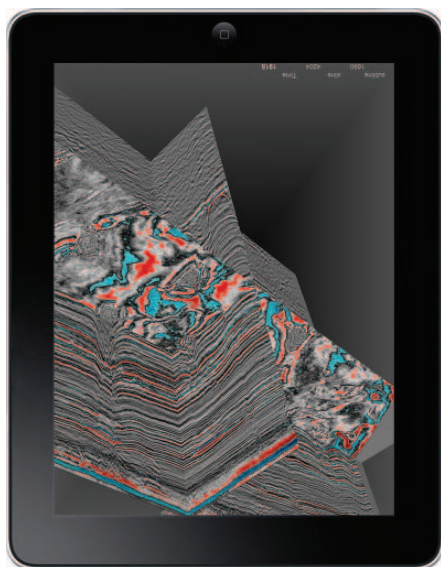
Fig. 1. Screen snapshot of one of my 'work-related' App collections.

has 1024×768 (4:3) resolution, which translates well onto LCD projectors. My main complaint is that the screen is very sensitive to erroneous finger touches and swipes, and successful iPad presentations can require great physical discipline. Other useful Apps with video-out functionality are GraphCalc HD (graphing), iMindMap Mobile HD (mind mapping and brainstorming), SketchBook Pro (freehand sketching), and GoodReader (read/view most text and graphic file types).

The physical size of the iPad presents something of a paradox. Whilst a delight to pack for travel, the 730 g unit feels heavy in the hand after a while, and it is not something you readily whip out of a pocket or bag every time you want to check something. There are, however, all kinds of solutions for such challenges, such as the Scottevest (<http://www.scottevest.com>) travel clothes with 20+ pockets. Steve Jobs was withering in his criticism of upcoming 7" tablets, equivalent in size to the Amazon Kindle electronic book reader (which my wife swears by), claiming the screen would be impractically small for tablet computing. I think I agree, but I often wish I could easily stash the iPad away like a phone. On the processing side (<http://www.apple.com/ipad/specs/> and <http://en.wikipedia.org/wiki/Ipad>) the unit is

surprisingly fast and flexible, although the onboard memory (256 MB DRAM built into the 1 GHz Apple A4 CPU) is too small for heavy computing. I bought the largest storage (64 GB) option, and took only about two weeks to fill that up. Frustratingly, the SD card adapter is programmed to only identify image files from a camera, and will not allow storage expansion. You can 'jailbreak' your iPad very easily, but any warranties are of course immediately void. In contrast to the factory iPad settings, a jailbroken iPad can run multiple applications simultaneously, accept external storage options, and perform a variety of other non-standard functions. But the fundamental capabilities appear to be essentially unchanged. Importantly, the official release of OS 4.2 in mid-November will bring multi-tasking, wireless printing and a few other key functions, so progress is inevitable.

One of the first things we did at PGS when the iPad was released was to build an App version of our internal visualisation platform ('holoSeis') using the software developers kit (SDK) downloadable from Apple. As evidenced in Figure 2, despite the 256 total onboard RAM, a 6 GB seismic data volume can be rendered and manipulated in real time with surprising speed and stability. Again, seismic data volumes are loaded via iTunes. The three



**Fig.2.** A 6 GB 3D seismic volume rendered in real time on my iPad.

orthogonal planes displayed in Figure 2 are manipulated using the touchscreen, as are any setting changes made from the relevant colour palettes and display parameters.

Admittedly, about half the 173 Apps on my iPad are of superficial value. There seems to be no limit to the ways in which I can remotely control the screen of desktop computers available



**Fig.3.** Dr Steven Ellis (University of Cincinnati) at the Pompeii excavations (courtesy of Apple).

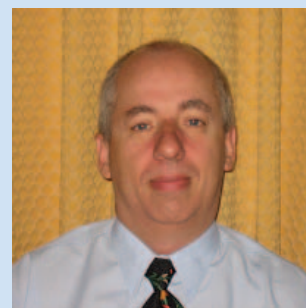
through a wireless network, stream video and other media in almost real time to my iPad, contact others through online portals, access online news and reference sites, or, naturally, play games. Where I used to read the paper TV guide, open an encyclopedia or magazine, or pick reference books off my bookshelf, now I almost inevitably pick up my iPad.

Probably the greatest current value in the iPad is as a convenient reference portal (e.g. manuals, databases, geophysical data images and presentations) and as a rapid note-taking device. The case study online at <http://www.apple.com/ipad/pompeii/> documents the use of iPad for archeological excavations at Pompeii. Indeed, mine goes everywhere, is regularly filthy and frequently dropped

(in its ruggedised silicone and plastic protector). That is certainly not possible with my regular notebook PC.

When the iPad can provide an X11 console window (and thus run Unix programs), and Apps become available for essential 'geophysical' tasks such as MATLAB or Mathematica, then my iPad might be considered a true alternative to my notebook PC. The lack of Flash support will apparently remain an irritant when using the web, but overall, Apple are off to a good start.

*Disclaimer: I am historically a Windows-based PC user.*



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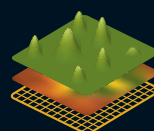
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