

Newsletter: Using Computers in Chemical Education Fall 2005

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[Links](#)

[Home](#) **Keeping track of media**

[Current Edition](#)

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Most of us have a huge array of media: movies, animations, pictures, PowerPoint (PP) slides, taped demonstrations, etc., you have created, also from textbook publishers and others. This creates the possibility of making our lectures more interesting and richer. With this huge amount of information comes the daunting task of sifting through it, picking appropriate material, then having it available to use when needed.

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We have just switched textbooks to Hill, Petrucci, and they provide all the above and two different sets of PP slides. I also wanted to include my own PP slides, animations, movies, etc. I use a Mac and it comes with a great program iPhoto to keep track of any photos, easy to organize and search, very useful for the few photos I use. A number of programs for working with movies are available. I have in increasing ease of use: Final Cut Pro, Final Cut Express, iMovie, and QuickTime (QuickTime is available for Windows). It turns out a number of movies available are too long for my use so I tried the above systems to edit the movies, and found that QuickTime (easiest to use) was quite adequate to select and save the portions of the movie I wanted. It takes about the same amount of time to edit as to watch, typically a few minutes. The result is a shorter movie better focused on the point I want to make, and takes less storage on my drive. None of the programs above are particularly suited to keeping track of the different movies. You need to setup your own system.

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In order to use the movies effectively I usually take a source such as the CD containing the movies and just go through one at a time and pull out the ones I find interesting. On a Mac just open an OS 10 window when you select a movie and click on the start movie button and the movie (as a miniature) plays right there. If it looks useful I change the name to something more descriptive for me and move it to a Chemistry movie folder. If it is germane to Chap 7 of the text I'm using I would call it '7-1 Atomic Spectra' for instance. This has the advantage of sorting the movies so it is easy to find movies for Chap 7 from many different sources, and tells me what it is.

Working on PowerPoint slides for Chap 7 it would be easiest to have the operating system window containing the movies open, preview the movies

there then drag and drop the movies into PP. You can have a 'Insert movie from file' command in the toolbar or find the same command in the menu bar (neither of these methods lets you preview the movie). Apple has a program Keynote that is similar to PP. It allows you to drag and drop or use its media browser that would show thumbnails of each movie, picture, or sound. If I click on thumbnails, it plays, and it will allow drag and drop. The same browser will show pictures, and sound.

At the moment since all three sets of PP lectures are in PowerPoint, I'm working completely in PowerPoint. I've found it easiest to look at both sets of the PP that came with the Hill text in Slide Sorter View at 100% zoom. Anything that looks too crowded will be difficult for students to use effectively. I use two monitors and in this view I can see enough of each slide to get an idea of the subject matter and how it will look. I determine which PP set of slides I will use the most then transfer similar slides from the other. Switching to Slide View on the combined result allows me to compare similar slides. Sometimes the choice is clear other times I combine and delete from both. Many slides are deleted at this point. Then my own slides are added to mix and again I usually delete more since I prefer my own slides.

Next I check the movies and animations available for the Hill Text edit as described above and insert the movies into the PP lectures, then insert my own movies from my own collection. Finally I select a Slide Design Master of my own and change all the PP slides to have the same design.

It's interesting seeing how others present material and I found it worth the effort to compare three sets of PP slides and select the 'best.' One interesting area I learned about is using Callouts – similar to the way dialog is added in funnies in the newspaper. It is a handy way to point to specific parts of a picture.

I do intend to convert some lectures to Keynote and see if it is more stable than PP, which has a habit of changing the animations I've selected and losing links to movies.

Backing up:

Most of us have considerable time and effort locked up in the material on our computer systems. After all that work of setting up your programs with the preferences you want, PP lectures with all the media etc., you'd like to keep your work and the computer operating system (OS) safe. A bootable backup clone with everything, operating system, applications, all your personal files and perhaps especially all your preferences for each program is needed. This will work well assuming you don't update the operating system and applications, and are going to do a smart update (just updates changes to your files) often.

Since most of us are updating our operating systems the chance of making a change then having it cause problems after the backup clone has been updated is real. If a serious problem occurs and you have to do an erase and install even though your personal files are safe, having to reinstall all your programs (with their updates) can be very time consuming and since your preferences may contain corruption replacing these is arduous.

A possible solution would be to have rotating backup clones (clone1 and clone2) and before you do major OS or multiple updates get the current backup clone1 up to date with all your personal files, etc., do the operating systems updates on this clone1. Switch to clone1 as your operating system and test it for a while.

If the updated clone1 is stable, then update the main system, smart update it from clone1 to pick up any changes you've made in your work, and switch back to the main system and continue the usual backup procedure you have. If clone1 is not working well, just switch to the main system, which is untouched, but doesn't contain the files you have changed. Depending on how serious a problem you have these files you have changed on clone1 may or may not be recoverable.

A more elegant solution (this program is for Macs) is [SuperDuper!](http://www.shirt-pocket.com/) (<http://www.shirt-pocket.com/>), which allows you to make bootable backup clones as above, and a Safety Clone. A Safety Clone allows you to make a copy of everything but your user files and non-Apple programs these remain on the main system (a Safety Clone may be on the same hard drive but has to be on a separate volume-the drive must be partitioned). The idea is to boot from and work from the Safety Clone that is on a separate volume (again this can be an external drive or a partition on the main system).

All your personal files remain on the main system, are updated there, and are linked to the Safety Clone. You do all your work running on the Safety Clone and run all updates on the Safety Clone and if disaster strikes simply reboot to the main system, which is on a separate volume, and everything is intact. None of your changes to your work are lost, since the Safety Clone was using the files on the main system, and you can continue working without the problem update! Later a new Safety Clone can be regenerated from the main system and you reboot to it and continue (after sending a note to whoever created the update that crashed your system which will probably be more polite since your system is still intact)!

The reason for all the backups is that our OS and applications are no longer as simple as they once were- they are spread all over the hard drive and to make a backup bootable it has to have its own volume, you can't simply make up a backup folder and throw all the files in it-it won't boot so you need to think ahead and figure out what you need -what has to be bootable, and setup partitions or separate drives for each. Keeping your OS and all your applications safe in a bootable form is one aspect, getting your most recent work and your files backed up is another.

In my case I use a portable Mac for all my work and don't have room on the hard drive for a partition for a Safety Clone and have some additional concerns. My own complete system is about 37 GB. I decided to use 2 external FireWire drives for backups. I partitioned one FireWire drive into two volumes of about 60 GB apiece. One has a full bootable Safety Clone of everything under my current OS 10.4.2, except my user files and non Apple applications. It took under an hour for Superduper! to create it (about 7 GB) and about 10 min for a smart update. The second partition contains a very stable OS 10.3 that is also a full bootable clone this doesn't get updated. A second FireWire hard drive is partitioned into two volumes one Backup1 and Backup2 each a bootable clone, that is 37 GB and took

under two hours to create. These two partitions are used for rotating smart backups of my user files (takes only a couple of minutes).

I recently decided to do a major combined OS 10 update as well as a lot of program updates so I booted from the Safety Clone did the updates and proceeded to use the Safety Clone for 5 days. Only one minor problem showed up, so I booted from my main system and did the updates on it. All the files I had worked on over the past five days were already there since the Safety Clone had used the same files.

For big current projects such as a movie or PP I keep an identical folder on a separate FireWire to backup these files –often.

If you are a Mac user here is a detailed review of Superduper!

<http://www.macworld.com/weblogs/macgems/2005/06/superduper/index.php>

I'd also suggest reading the Appendix on page 43 of the Superduper! User's Guide that discusses partitions before you even consider backing up. You really need to think through what you need and setup partitions and volumes before you start. Superduper! can make many types of copies, clones and Safety Clones.

For Mac user's: You are probably aware that OS 10 is a Unix system which requires constant maintenance. Apple automated this to occur at something like 3 AM. It doesn't happen if your system is not on. A convenient way to automate this process when your Mac is on is to use [Macaroni](http://www.atomicbird.com/) (<http://www.atomicbird.com/>) handles **regular maintenance** for Mac OS X, including the Mac OS X *repair privileges* process as well as Unix-style maintenance. Additionally it can remove localized files, mostly info in different languages. It freed up almost 2 GB of space on my hard drive!

Combining media on a DVD and learning:

Most of us have used various media and programs to manipulate it, and there is always a learning curve. The ability to use powerful programs together, such as Apple's suite iPhoto, iMovie, iDVD, and iTunes and Microsoft Office, is enhanced if you have experience in all these areas. To increase my expertise I recently worked with a book ([The Macintosh iLife '05](#) by Jim Heid) and the included DVD that allowed me to watch an expert go through each step of the many possible to enhance a picture, and combine video clips, sound and transitions with text. It was quite useful to be able to stop the DVD in one window and try a process with my own data in another. Being able to check the previous steps by going back on the DVD was like having a book with thousands of figures. It was really helpful exploring techniques of interest. I'm not sure how to apply this technique to my students learning, but it seems much more effective than the usual material on the CD's included with text books.

[Return to Newsletter](#)