

## Digital video editing allows you to fine-tune your footage

There is an old expression that only an amateur shows all his work. That is certainly true with photo, but even more so with video. Being able to edit video in your computer has never been simpler. Removing that shaky or blurry footage, enhancing the appearance, adding titles and music can be done now with a few clicks. If your friends cringe when you suggest watching some home video, perhaps with a little editing you can produce something they will want to see. And keep in mind video editing doesn't just mean working only video. Most video editing programs can assemble slide shows from your still images too.

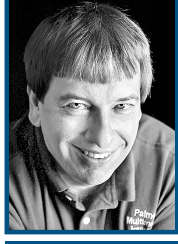
Let's take a look at the steps for editing a home video but keep mind two things, video editing is very time intensive and video can consume vast amounts of storage on your computer. You'll soon learn why professional services command a large price.

The first step in video editing is to get the recorded video information from the camera into a computer. If you were using a camera that records to a DVD or SD card, this process would simply involve copying files from that media into your computer. If you recorded on tape, the process is a bit more involved. If the recording were on analog tape like VHS or 8mm, you would need an analog to digital conversion device. This device would be connected between your camera and computer to convert the original analog signal into digital. If you recorded in a digital tape method, you would connect the camera to your computer via a USB2 cable or most likely an IEEE 1394 cable commonly referred to as firewire.



PHOTO PROVIDED

Most video editing programs have a similar interface which includes a preview window, video clip window and a time line which shows the order of edited video.



WAYNE PALMER

## Bits & BYTES

Whether analog or digital tape, the transfer of data into computer is done in real time, which means if you have an hour of tape, it takes an hour of time to import the information. You will also need plenty of space on your computer. When copying video to your hard drive, you need 1GB of space for about every five minutes for just standard definition video. Having a second hard drive for capturing video can be very useful and will keep you from filling up your primary drive which would cause problems.

Capturing video from tape is a rather grueling task for your hard drive. To keep up with the constant flow of imported data, the information is ran-

domly spread across the drive causing the files to be fragmented. When the data is fragmented, playback of your video can be erratic as the computer searches for and tries to playback the data, which is scattered across the drive. To avoid this problem, it is recommended that you run your computer's defragging utilities to make the captured data contiguous.

With the data in the computer you are finally ready to begin editing. There are a lot of choices when it comes to video editing programs. Windows even include a basic editor called Windows Movie Maker if you want to experiment before graduating to a more serious pro-

gram like Adobe Premiere Elements. The one good thing about most editing programs is that they are all very similar. If you have worked with one, it usually doesn't take much time to familiarize yourself with another. Most interfaces consist of preview window, a window showing the various segments of captured video, often referred to as clips, and a time line that gives you an overview of the order of the arranged clips. The timeline can be set to view the entire project or zoomed into display mere fractions of second for precise editing. Most programs have options to change the appearance of the video with an array of adjustments or filters and of course the ability add titles. You will also have the option to adjust the sound and add additional sound tracks or music.

There are a few concepts to keep in mind when editing video. When you edit, you really don't change the original information. You simply compose a decision list of the

items you want to show. So when you delete a segment, it is not erased from the hard drive. Also when you make an adjustment to the video, like making it brighter or adjusting the color, again you don't alter the original information. Instead, you generate a new video clip, which is played back instead of the original. Newer computers may be able generate the adjusted video during playback using the computer's RAM, but often an entirely new file must be created called through a process called rendering. Depending upon your computer's speed, rendering can also be a time consuming task. Note also, if you were to alter all your video clips, you would end up doubling the amount of data imported as new data would be generated with the changes you made.

Again all this takes time as well as reviewing your changes. When you are satisfied with your edits, you will want to export the video to share with others. Perhaps your production will be headed for an online sharing site or you just want to make a DVD. Each has its own special requirements.

When destined for the Web, the video will need to be compromised in quality in order to make the file small enough for transferring over the Internet. This compromise may be in a reduced frame rate, which results in video with less than life-like results. Another compromise that may be taken is in making the video smaller. This results in a picture that does not fill the computer screen. Some editing programs are very user friendly in this aspect and make all the complicated decisions for you while some others may require a little bit of back-

ground knowledge in order to make a good decision.

One of the steps taken to create a DVD is to get the video file to fit the size constraints of a DVD. As mentioned earlier, 5 minutes of video is equal to 1 GB of storage. With that ratio, you would only be able to get a little over 20 minutes of uncompressed video on the DVD. So in order to get a longer project to fit, the program must go through and compress the video footage similar to how a still camera compresses an image into a JPEG file. With video, there are 30 pictures per second, so the process takes a while.

If going to DVD, the goal would be to create the highest quality image while still getting the file to fit on the DVD. In addition, you may want to author your project, which entails creating menus and shortcuts to locate different sections of the video.

One common misconception about DVD is that this compressed file is simply recorded to disk and the job is done. The DVD that plays in a home DVD player uses a proprietary file system. So the compressed file must also be converted into that system. Fortunately some video editing programs can do the compression and conversion in one step. Once all this is done it is burned to a DVD ready for sharing.

This may all sound like a series of complicated steps, but it really is just time consuming. Making the effort to show your imagery in an organized fashion may result in friends want to see your video instead of making excuse to head home.

Keep those ideas coming to [pmi@palmermedia.com](mailto:pmi@palmermedia.com).

## Scientists toil on turning pond scum into military jet fuel

LOGAN, Utah (AP) — Somewhere among the beakers and the bubbling green-tinged tanks in this Utah State University lab, Jeff Muhs is searching for champion pond scum for Uncle Sam.

If he and others like him around the country are successful, algae-based biofuel could one day power one of the world's biggest gas guzzlers: the U.S. military.

Headly stuff for a simple sun-sucking organism. But algae's ability to grow fast and churn out fatty oils makes it an alluring prospect for a military looking to lessen its dependence on foreign oil.

"It inherently makes sense to start there," said Muhs, who runs Utah State's energy lab.

Work at the lab is part of a Pentagon project aimed at fast-tracking research to eventually produce algae-based biofuel that costs less than \$3 per gallon, can be produced at a rate of 50 million gallons per year and meets strict military standards.

"We believe it's possible. We wouldn't invest in it if we didn't," said Jan Walker, a spokeswoman for the Defense Advanced Research Projects Agency, the Defense Department's main research arm.

In December, DARPA awarded a \$20 million contract to General Atomics and a \$15 million contract to Science Applications International Corporation (SAIC), two San Diego-based research companies. The contracts ask the companies to find a biofuel surrogate for JP-8 — the petroleum-based fuel for military jets, planes and other vehicles. Lab tests and smaller-scale experiments over

several decades have shown that algae oil can be turned into fuel. But the military, which spent more than \$12 billion on fuel in 2007, wants something large-scale and cheap.

"We view that as the primary challenge of the job, to get it where it will serve as a source of affordable JP-8," said Bill Davison, vice president for the Advanced Process Systems division at General Atomics.

The workload is being spread among subcontractors from universities and private research firms across the country.

Part of the trick is finding the right algae for the job.

There are about 40,000 species to choose from. Many are efficient at converting nutrients and carbon dioxide into the organic matter that provides oils that can later be refined and used as a base for biofuels.

The problem is certain algae grow fast — some can double their mass several times a day — but produce little oil. Others produce gobs of oil but are slow growers.

"You have to find a happy medium," said Muhs, whose lab is examining about 300 kinds of algae.

His researchers are running experiments on the effects of temperature, sunlight and other factors on productivity. Some like freshwater, others thrive in salt water. Tweak their living conditions — nutrients, carbon dioxide, flow of water — and their ability to produce oil changes along with it.

"There's so many variables to look at," Muhs said. "You can begin to see why there's a need for research. It's a daunting

task." At Arizona State University, scientists are testing about 500 strains, searching for the most robust specimens in flasks and beakers that could make the transition to larger outdoor ponds and growing facilities.

"We call them the athletes. If they perform well in the lab they get to play on the big field outside," said Milton Sommerfeld, a professor and researcher at the university.

He was part of a federally funded project that started in the 1970s to look at the viability of algae-based fuel. It's still too early to say what kind of growing systems will work the best and exactly how laboratory successes will be scaled-up for commercial use, he said.

Intensified interest in recent years, he said, will move the process along more quickly.

"But it's going to require tens of millions of dollars," he said.

Part of what makes algae attractive is that it doesn't compete with food sources in the same way ethanol does and it has the potential to produce far more biofuel per acre than corn or soybeans.

There are still plenty of unknowns, including how much energy it will require to produce fuel from algae at a large scale and whether it's better to grow algae in pools or in enclosed tanks called photobioreactors.

Researchers are also trying to determine the most economical way to extract oils from the algae and put it through the refining process.

The rough cost estimates for producing algae fuel vary right now from

\$10 a gallon to \$40, said Al Darzins, who manages the national bioenergy center at the National Renewable Energy Laboratory in Golden, Colo.

"Obviously, that's not cost effective," Darzins said. "So we have our work cut out for us."

NREL has ramped up its own research into algae-based biofuels a decade after a similar program was scrapped because the fuels were considered too expensive to compete with petroleum.

Today, he said, there are hundreds of companies studying algae fuels. A few high-profile tests — including commercial jet flights using a blend of algae- and petroleum-based fuels — are intriguing but nowhere close to showing that commercialized algae fuel could replace the 100

million gallons of petroleum diesel and jet fuel burned each year, he said.

But research from this Pentagon-funded project could help spur use of algae-based fuels in the commercial aviation mar-

ket, according to Paul Bollinger, a vice president with SAIC.

"The military has the potential of serving as a market initiator and the airlines as a market maker," Bollinger said.

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