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Timelapse Photography

A (VERY) BRIEF INTRODUCTION

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Why Shoot Timelapse?

I find there are three main reasons I personally shoot timelapse:

- To reveal motions that are not normally perceived by the human eye at normal timescales (natural processes of growth or decay, changes to the position of the sun and clouds, etc.)
- To speed up slow moving processes (slow moving construction vehicles, river traffic)
- To reveal patterns when total motion is viewed as a whole (patterns of traffic in the city, flow of fog or clouds over obstacles like mountains or tall buildings)

What Do You Need?

You can get started in timelapse cheaply. If you have already invested in some photography, you probably already have what you need for basic timelapse work. Any additional equipment that might be needed can be obtained at modest cost, at least until you're bitten by the timelapse bug, then it can become a money pit.

The basic items to start:

- A camera — depending on the types of exposure you do, you may need one that supports the “bulb” setting (see “bulb ramping” and long exposures below), also a connector port for a remote shutter release if necessary
- A tripod — some support to keep the camera in the same position over many frames while shooting
- An intervalometer — basically a remote shutter release attached to a timer. Some higher end cameras will have this functionality built in (notably Nikon models and high-end Canons). Online shopping will find cheap intervalometers for about \$25 to \$50, be sure you find the right device that will connect to your model of camera. Beware of paying for name brands! At the time I bought mine, the Canon branded intervalometer for my camera cost about \$90. The exact same piece of hardware (and I do mean exact same!) but branded with a no-name type brand out of Hong Kong sold (and still sells) for \$25Cdn. More feature-rich intervalometers (see “bulb ramping” below) will set you back more, often \$100 and up. So, start simple to see if you like doing this!
- Batteries — depending on the sequences you will shoot, you may be operating your camera for hours at a time. During such a long shoot, you may need more than one battery. I have a “camera grip” for mine that holds two batteries, so I can shoot twice the length of time. There are also often external power options for various models (either using a dummy battery pack, or a separate power plug on the camera body) that would allow you to use high capacity “power banks” (higher end cousins of “cell phone chargers”) or AC power if you have an outlet handy.
- Software — to assemble the frames you shoot into a video. We will discuss more about this below (see “Some Assembly Required”).

Common Intervals

What interval (the time between frames) you shoot will depend on the subject and your artistic intent. These are some of the more common intervals you'll find tutorial sites talk about:

- 1 to 3 seconds: faster moving subjects like cars, people, moving animals, clouds on a windy day, some people mount a camera on their car dash, shoot every 2 to 3 seconds and capture a road trip at "warp speed"
- 3 to 5 seconds: slower moving subjects like river traffic, average cloud movement, or capturing the movement of the sun on the horizon
- 15 to 30 seconds: makes movement of the sun (or shadows) across a scene more apparent
- 2 minutes: plant movement during the day, especially blossoms that open/close during the day (sunflower head moving to follow the sun?)
- 5 to 15 minutes: very slow-moving subjects such as certain construction processes (moving a bridge span into position), or following the growth of plants over several days (or the decay of a corpse)
- 1 day: for very long drawn out processes such as human growth. You will find a lot of people capture a photograph of their baby once a day. How dedicated they are shows in how long they kept it up! (The longest I've seen is one that followed the child from birth to age 14!)

Know your Tools!

Get to know your camera! It can be frustrating to arrive at a location, ready to shoot a multi-hour timelapse sequence and find yourself fighting with the equipment! Read your manuals and know how to perform the tasks that are required of you by this genre:

- How to lock focus (a "focus lock" feature, or "manual focus" feature)
- How to do manual exposure setting, either using the camera's built in light meter, or an external one
- How to lock aperture ("aperture priority" or how to set it when doing manual exposure)
- How to shoot repeated frames (using an external or internal intervalometer) – setting the interval, the number of frames required, and the shutter speed (if necessary)
- How to quickly change memory cards and batteries, how to connect to an external power source, and be sure you can do this procedure while the camera is mounted on a tripod (and rapidly set up your exposure/shooting settings to your sequence is not overly interrupted)
- Have a good feeling for how long a battery will last when shooting continuously (how many shots you will get) bearing in mind many factors affect this (are the camera displays running, is it overly cold outside, how old is the battery, etc.)
- Know how many frames will fit on the card you are using (either in JPEG format or RAW depending on your preferences and requirements)

Shooting in the Field

When shooting in the field, you will follow these simple mechanical steps:

- Depth of field should not change (usually) — this means you want to use the same aperture for the entire timelapse sequence. This means shooting in “aperture priority” or better yet, manual exposure.
- Focus should not change (usually) — so this means setting your focus before you start shooting and locking it (or using manual focus)
- Your ISO should not change — this means disabling the “Auto ISO” setting in your camera, especially if you are using an auto-exposure mode (e.g. Aperture priority).
- Cover your camera eye-piece if necessary (mirrored SLRs that use pentaprisms to view through the lens, if your eye isn’t in the eye-cup, this can leak enough light into your camera to cause flaring or mis-exposed images)
- Set the interval on your intervalometer
- Start the shooting sequence
- Contemplate life — but be ready to change those batteries and memory cards!

Shooting Considerations

When shooting in the field, there are some basic considerations to keep in mind.

First and foremost: compose your image! You are still creating a photographic work. If you are merely practicing technique and mechanical setups, this is less of a concern. But if you are ready to create a timelapse you will want to share with others, then consider the environment you are capturing. Is the motion concentrated in one area of your frame? If so, it becomes the key subject and you should compose your frame around it (placing the action at a Thirds point (or centered if that makes more sense, can you make use of composition elements like framing or leading lines, etc).

RAW VS. JPEG

The debate which rages for still images continues in timelapse (of course pro RAW shooters insist shooting RAW is the only way!).

Shooting JPEG Pro’s:

- you need to be more confident in your exposure settings, colour saturation, etc.
- More images will fit on your memory card
- Most cameras will be able to pick a JPEG size that fits your video resolution (if you plan to create a video that uses the full frame) — typically 1280x720 (720p HD video) or 1920x1080 (1080p HD video). Or if you want 4K video: 3840x2160, etc.
- JPEG files are typically smaller than RAW, so will write to your card faster

Shooting JPEG Con’s:

- Mistakes made in exposure are harder to correct in post, there is limited data outside of the pixels in the image

Shooting RAW Pro’s:

- Exposure that is “in the ball park” can be fixed or tweaked later
- Extra exposure data allows for more radical exposure tweaking in post

Shooting RAW Con’s:

- Fewer images will fit on a memory card (will you need to change cards one or more times during a long sequence?)
- Files take longer to write to the memory card, so may limit how short an interval you can shoot

SHOOT MORE THAN YOU NEED?

You may enter a situation where you expect to need a certain interval to achieve a desired look. But you may want to consider shooting at a shorter interval “just in case”. Consider the case where you expect to shoot with an interval of every 10 seconds (e.g. moving clouds). If you get back to the desk top and see that the clouds were moving faster than you anticipated, you don’t have any alternative that can fix it than to go out and shoot again.

But if you shot at an interval of every 2 seconds, you have more choices. If you choose every 5th frame, you now have your original interval of 10 seconds. But if you decide that motion is too choppy because the clouds are moving faster than expected, you can select every 3rd frame to see how it looks with an interval of every 6 seconds. (Some editors will allow you to do this, in other cases you might need to do use scripts to export the frames and re-number them.)

For the most part, remember that pixels are cheap – gas and time to go reshoot a sequence may not be (especially if it was during a once in a lifetime vacation to a remote location, or a rare phenomenon that is not likely to repeat itself).

INTERVAL CONSIDERATIONS

Know your camera’s “write time”, i.e. how long it takes the camera to write a frame to the memory card. (both RAW and JPEG) When setting your interval, you must not only allow for the exposure time, but the time the camera will need to move the image from its buffer to the card.

If your exposure was 4 seconds, and your RAW images take 3 seconds to write to the card, then you would **not** be able to use an interval much **less** than 8 seconds (depending on your intervalometer, you may not be able to specify intervals with fractions of a second).

If your interval is too short, the images will start to get queued up in your camera’s buffer (most cameras will have a buffer that can hold 5 to 12 images to support “burst mode” shooting). Once the buffer is full of a back-log of frames, the shutter will not fire until enough space is free in the buffer for a new frame. This can result in missed frames and uneven timing in your sequence. The result is that motion may have gaps in it affecting the smoothness of the motion.

Another aspect of longer intervals is to be aware of your camera’s “sleep timeout” (or it may be called “power saving mode” or other name). Most cameras, if the user takes no action with it will go to sleep or even power down completely to save your batteries. If your interval is longer than this time, that means after your first shot, the camera may power down and not shoot any more frames. Most cameras will allow you to select from a variety of timeout values (30 seconds, 1 minute, 5 minutes...) or even disable it completely. In the case of long intervals, be sure your camera is not going to fall asleep once you start your shooting!

OTHER SHOOTING CONSIDERATIONS

Unless you need to monitor your exposure (histogram) during a sequence, it is recommended you turn off any automatic “review” of images on your camera’s display. Over a long timelapse, this can give you a significant amount of additional shooting time since you will drain your batteries more slowly – LCD screens consume a fair amount of power from your batteries.

If your camera can accept an external power supply, consider using one during super-long timelapse shoots.

For mirrored SLR type cameras (through the lens viewing), you should also cover your camera’s eye piece when shooting (typically the camera will come with a cap to slide over the eyepiece). In these camera designs, light can reach the sensor/film via that rear viewfinder spoiling your exposures (normally your eye is over the viewfinder when shooting, thus blocking light from entering the camera). Mirrorless cameras do not have this problem and often your viewfinder is just a small screen in the viewfinder eyepiece.

Some Thoughts on Exposure

The main exposure controls in a timelapse will be aperture and shutter speed.

APERTURE

It is often recommended to shoot your sequence with your lens at the widest aperture possible for your selected focal length. Normally, when composing your frame, the camera has the aperture completely wide open so you can have the best possible view through your viewfinder. Then when you take the shot, the camera dials the aperture to the diameter selected (as dictated by your f/stop selection and focal length) and releases the shutter.

While the diameter of the aperture is “pretty close” each time, it is never EXACTLY the same from shot to shot. This **very** slight variation in diameter results in slightly different exposure in different frames. As a result, when several hundred shots are strung together in video form, the slight differences in exposure will appear as a “flicker” on the screen in the final video.

As a result of this quirk in apertures, most timelapse blogs will recommend shooting with the widest aperture possible for your chosen focal length so that the camera is not constantly operating the aperture and getting slightly different results.

If you have a lens that allows it, use a manual aperture (the lenses with the old f-stop rings) where the aperture is locked in place once set. This means the aperture is not changing from shot to shot and your results will be flicker free (well, less flicker).

If you don’t have such a lens, you may be able to use a “cheat” if your camera uses detachable lenses. Most lenses have motors in them to move the aperture, and there are electrical contacts between the camera and the lens to activate the motor to set the aperture. You can set your f/stop and use your “depth of field preview” button which closes the aperture to the selected f/stop so you can see how the DOF will look in your composition. While holding the DOF preview button down, unlock the lens and rotate it slightly as if you were taking it off (it doesn’t need a large turn, just enough that the electrical contacts are disconnected — you don’t want your lens falling off when you start shooting!). The lens loses power and the aperture is now locked at your selected f/stop. Ensure your camera will still take photos if you do this (most will, though they may display an error message — they usually allow this, so the camera can work certain kinds of “dumb” attachments that have no electronics in them).

SHUTTER SPEED

Your other exposure control is your shutter speed. Part of your choice of shutter speed is exposure, but shutter speed also influences the aesthetic of your timelapse. Slower shutter speeds show more motion blur for moving subjects. This blur will often “smooth” the sense of motion perceived in the final video.

A common trick for scenes with crowds of moving people is to use a shutter speed of 1 to 1.5 seconds. For walking people, this will create long streaks behind them, but they are still visible (going much over 2 seconds shutter and moving people may start to disappear from the scene!). For a timelapse of a busy market square, this can yield a very interesting video.

Given that you may be trying to shoot a sequence with wide apertures and slow shutter speeds, you may find yourself having to add neutral density filters to bring the exposure under control. In these cases, understanding long-exposure photography will come in handy.

Sun Rise — Sun Set

From about 1 hour after sunrise to 1 hour before sunset, your exposure for a timelapse is fairly consistent (barring changes in weather or other lighting affecting conditions). During these times you can set your exposure at the start of your sequence and pretty much forget about it.

But once bitten by the timelapse bug, almost every aspiring timelapse artist wants to capture a timelapse that spans sunrise or sunset. This is often referred to “Holy Grail timelapse”, or “shooting the holy grail” because for many years it was notoriously difficult to do (or rather to do it well).

When the sun is near the horizon lighting conditions are changing rapidly. During the 30 minutes that spans sunset (15 minutes before to 15 minutes after), you will find the light levels can easily drop 10+ stops in that period. How do you deal with this in a timelapse?

APERTURE PRIORITY

The first approach that many will use, that will generate reasonable results, is shooting in Aperture Priority (the automatic mode where your camera keeps a fixed f-stop and changes shutter speed (and ISO if you didn't disable Auto-ISO) to maintain a standard exposure. If you use this mechanism, be aware your shutter speed will be changing, which means the interval you choose has to be longer than the longest shutter speed you anticipate using. This may take a few practice sessions to learn what works for you.

BULB RAMPING

The next approach that many use is called “bulb ramping” (or sometimes “shutter ramping” or “variable shutter”). This is a function of more expensive/complicated intervalometers — you set the shutter speed to be used at the start of the sequence, and the shutter speed at the end. The intervalometer will then gradually increase the shutter speed during the sequence to attempt to maintain a decent exposure. For example: at the start of your sequence you might be shooting at $1/10^{\text{th}}$ of a second. By the end of your sequence you might approach a shutter speed of 2 seconds. That means at the half-way point of your sequence, the intervalometer would be shooting with a shutter speed just under 1 second (0.95 seconds).

Note: when you think about it, this is what shooting Aperture Priority is doing, but you maintain more control over the range of shutter speeds that will be used.

The term “bulb ramping” is used because you set your camera to the “bulb” setting, so the remote shutter release controls the length of exposure. And “bulb” comes from the ancient times in photography when the shutter release was a rubber bulb you would squeeze with the resulting air pressure holding the camera shutter open until you released it.

EXPOSURE SMOOTHING

The final common approach to Holy Grail timelapses is to shoot your main sunset (or sun rise) sequence as a series of shorter sequences shot at constant shutter speeds. This approach is almost always shot in your camera’s RAW format since it has enough data typically to adjust exposure ± 2 stops of your selected exposure. (better cameras capture a wider data range, learn what your camera tolerates for exposure in RAW!)

As the lighting conditions change, you adjust the shutter speed for the next segment of frames. E.g. you start out at $1/15^{\text{th}}$ of a second (which in this example would be 1 stop over exposed) and shoot for perhaps 5 minutes at once every 3 seconds (100 frames). If you’re nearing sunset, your light levels may have already dropped 2 or 3 stops (you started out 1 stop over, and now have dropped 3 stops, so you’re nearing the limit of your 4-stop spread in RAW). So, the next 5 minutes you shoot at $1/4$ second every 3 seconds. Then another 5 minutes at $1/2$ second, and another 5 at 1 second. You could continue this up to 2 second exposures at which point you reach the limit of your interval. Some variations of this technique often start to lengthen the interval as darkness increases to allow for longer shutter speeds (sometimes referred to as “interval ramping”). **Note:** this is a hypothetical example, you will need to determine the rate of change of light and how often you need to adjust your exposure based on your camera and location specifics.

Once you have your series of “segments” shot at different exposures, you process these frames using software that will “smooth” the exposures across the entire sequence. For Lightroom users, there is a very good plugin designed for this specific style of shooting called [LrTimelapse](#). The free version will allow you to process up to 400 frames. If you decide you like doing timelapse, then for longer sequences, you can purchase the “pro” version (which also allows processing for larger format video like 4K and 8K). The software you use will evaluate the exposure conditions and attempt to create a smooth curve of exposure across your entire multi-segment sequence. With practice and experience, the results can be quite stunning.

Stepping sideways — Hyperlapse

Once you have mastered the basics of timelapse, you may want to try its cousin genre: Hyperlapse.

In Hyperlapse photography, you are shooting in the style of timelapse (multiple still images that will be combined to form a video sequence), but you add camera movement to the mix.

The key points for a successful hyperlapse are:

- Move the camera consistently between each frame, ideally the same distance each time. People often will move the camera over a regular divided surface. E.g. A plaza with tiles, or a boardwalk with planks, where they can move the camera “1 tile” or “3 plank widths” for each frame. A traditional practice is to move your tripod “one foot” – i.e. have the tripod with one leg in the back, put your heel of your foot in front of that leg, then move that tripod foot to the toe of your foot, take your shot and repeat, one step at a time.

- Keep a “target” at a consistent point in the frame (or change target points very gradually). Typically, the photographer chooses a point in the scene that is under one of their auto-focus points that are usually visible in the view finder — they then keep that target point in the scene under that same auto-focus point as they move their camera.
- Hyperlapses are often “landscape” type scenes (wide angle, lots of subject material) and as such are shot with focus at infinity (as deep a depth of field as possible).
- Consistency of interval is less important. You take each frame as soon as you can after re-framing your next shot. As such, movement of elements in the scene (people, vehicles, clouds) may not be as smooth or consistent as in “regular timelapse” video. However, with practice, you will find your movement of the camera becomes easier and you may be able to approach shooting with a fairly regular interval (e.g. every 4 to 5 seconds).

You can also play with more static subjects in a hyperlapse, having a person stand completely still for the entire sequence as people in the scene flow around them. Or you can move the static element a set amount in the frame with each shot (if it’s a person, have them assume the same pose at the new location) and the subject will appear to “slide” around in the scene. This is the basis of stop-motion animation, so you can add that technique to your hyperlapses.

Getting Fancy with Gadgets

While you can get started doing timelapse cheaply, it is a genre of photography where you can easily spend thousands of dollars on gadgets.

One of the cheaper (and so the first?) timelapse gadget is the motorized panning head. Mounted on your tripod head, and the camera on the panning head, it will turn the camera slowly, allowing you to capture a timelapse sequence that pans across your scene, adding some animation and drama to your video.



These heads come in varying degrees of complexity (and therefore, cost). At the simplest they turn at a fixed rate as long as you let them run. The cheaper ones maybe powered by a wind-up spring (so consider them an over-glorified egg timer). The next step up are electrically powered motors, usually running from an internal or external power source. Next comes more control over rotation, usually allowing you to specify the amount of turn and how long it will take to complete that turn. All these previous versions will be constantly moving, so requires a shutter speed that will not show blur as the head turns. However, at the “pro” end of the spectrum are devices that have all the controls (including velocity ramping), but also know your shooting interval and will only move the head between shots.

Some key points to consider when purchasing a panning head:

- Will the head support you camera weight? If you have a larger DSLR, make sure the panning head can move it! Some cheaper panning heads will only turn a small point-and-shoot camera or smart phone.
- How smooth is them motion? Is it slow enough for your average exposure situations? Wind-up panning heads may slow down as the spring inside unwinds, meaning your timelapse video may slow its panning motion towards the end
- These kinds of panning heads are typically for horizontal motion only, you must shoot with your tripod/camera level. If you want to pan vertically, that requires a different gadget (see below)

The next type of gadgets common in timelapse work are “dolly rails”. Your camera will typically be mounted to some kind of “cart” that then moves slowly along the rails. If you search on YouTube, you will actually find quite a few DIY dolly rail systems of varying complexity. Similar to panning heads, the rails and cart mechanisms range from cheap to pro-expensive.



Smaller rail systems (2 to 3 feet long) will sit on top of your tripod. More expensive systems have their own supports and will sit on the ground. Some even are extensible, allowing you to join multiple rails together letting your camera travel many feet.

If you want to move your camera during a timelapse and it will move over a relatively flat surface (flooring, tabletop, tiled patio), then a free moving dolly “vehicle” may be your next gadget purchase. This class of gadget looks essentially like a motorized roller skate for your camera.

Again the models vary from modest to horrendously expensive. Many lower end ones are now controlled by a smart phone using a WiFi or Bluetooth connection, saving the cost of a complicated control panel. Some can only move in a straight line, others allow you to angle the wheels so the camera can move in a circular path (e.g. orbiting the subject of your timelapse).



The last line of gadgets commonly used in timelapse work gives you that final 3rd dimension of movement: the pan-tilt head. In addition to being able to pan the camera horizontally, it can also tilt the camera vertically. This, combined with a dolly mechanism (rails or roller-skate) can result in some very complicated movements during your timelapse. If you go so far as to get a pan-tilt head and dolly system for your timelapse, it’s time to admit you’ve become a timelapse fanatic.



Some Assembly Required

So, you have a few hundred (thousand?!) frames shot; you will need software to import all your timelapse photos and generate the actual video.

There are many (many!) video editing solution on the market that can do this, some are free, some are not. However, there are a number of good video editing applications available that have a free version that can be updated to a paid “pro” version. The free options will allow you to try out your hand at timelapse and if you find yourself getting into it (or video editing in general) you can consider upgrading your software. Often the free version will have missing features from the paid version, restrict how much video you can work on, limit how much video you can produce or put a watermark on your video output.

Almost every video editor that can import a frame sequence will require that the images be numbered sequentially with no gaps. Often when exporting from your photo managing software you will choose some kind of base name and the software will append a number to it.

Some notable applications in the market:

Photoshop — Many photographers now have the Adobe subscription for Photoshop CC. since version 5.5, photoshop can import an image sequence and generate video. (Note use the “File / Open...” menu, NOT the “Open” button on the opening splash screen of Photoshop CC. In the photo selection dialog, on the bottom you will see a small checkbox “image sequence” — check this off and select the first photo in your sequence and click “open”. In photoshop, select the “Motion” workspace layout and you will see a “Timeline” panel which allows you to preview the video from your photos. Photoshop allows you to do some reasonable basic video editing (photoshop filters can be applied to the whole video if you convert the “photo” to a smart object), though it is clunkier than using an actual video editing application. (but if you’re already paying for PS, this will let you get started)

Virtual Dub — this is an open-source piece of software (this means it is free and will probably remain free for the foreseeable future; open source software is usually developed by a community of developers, so while the quality is often high, it is not guaranteed). VD is NOT a video editing application, it is what is known as a “frame server” which can create quite complicated effects in video, but usually does so using a scripting language (called AVISynth) – which means if you are not used to writing code, the learning curve can be high. However, developers have made it easy to import an image sequence and output it to video (the default “no-script” mechanism will output video “as is”, and plug-ins have been written to allow output of H.264 (the basis for MP4 aka HD video) with relative ease. If you want to create basic timelapse video with absolutely no cost and no “free version limits”, then this might be the solution for you.

Adobe Premiere Pro— this is the video editing application from Adobe, it is full featured and used to edit Hollywood productions. You can subscribe to Adobe to use it with for \$20/month. It is also included as part of their “all apps” subscription.

Adobe Premier Elements — this is a stripped-down version of their “Pro” video editing application. It can be purchased with a 1-time fee as opposed to Pro’s subscription model. But it can import an image sequence and treat it as video for subsequent editing.

Lightworks — A fully featured video editor (again, has been used by major film productions for their editing), it has a “free” version that lets you create MP4 video up to 720p (1280x720). For higher resolution video (up to 4K), there are options for subscription licensing or 1-time purchase.

DaVinci Resolve — another full featured professional video editing application (well known for working with custom hardware editing controls, for high end professional productions). “*DaVinci Resolve*” is their

free version, while “*DaVinci Resolve Studio*” is their paid on (at time of writing, around \$300US). The software is published by Black Magic Design which is also a multimedia production hardware manufacturer. Many timelapse artists extol the virtues of DaVinci Resolve, having all the features needed for amateur productions (and then some), with the paid version intended more for high end professional productions like feature-length films.

HitFilm 4 — another well-touted video editing application. Their “Express” version is free. If you buy the QuickTime media encoder libraries from Apple, you can produce QuickTime media (“MOV” video container). Can be upgraded to several flavours of paid versions.

LrTimelapse — this not a video editing application, but rather a Lightroom plug-in. Serious timelapse shooters will find it invaluable (assuming they also use Lightroom and work with RAW images) in pre-processing your frames to remove flicker or smooth exposure across a sequence (especially when shooting the Holy Grail). The free version is full featured enough for most timelapse shooters with an upper limit of 400 frames. Additional features (and unlimited sequence length) is available in “Private” (99€) and “Pro” (250€) paid versions. Upgrades from older paid versions cost about 50% of the new price. The plug-in is mentioned by almost every “big time” timelapse artist.

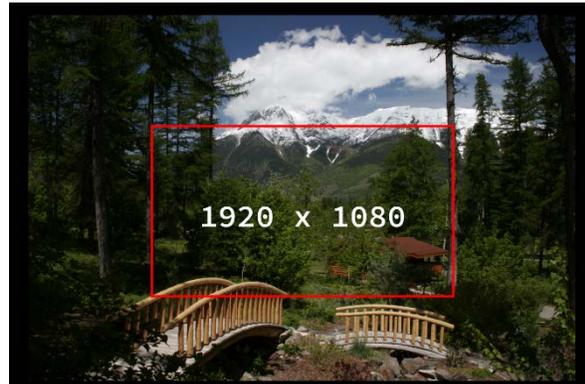
Image To Video — if your timelapse budget is very modest (i.e. you don’t want to spend anything on new software) and you don’t like the idea of learning a complicated video editing application, this little tool might be for you. It can take a series of images (PNG, JPG, BMP formats) and create a video from them — and that’s all it does. It outputs in the older container formats (AVI, MOV) using your choice of some common codecs (coder/decoder – the “library” code for creating a particular kind of video) such as MP4, WMV, QuickTime and FLV.

Cheating without the Gadgets

The gadgets mentioned above allow you to add some interesting motion to your timelapse videos, but even without them, you are able to generate some interesting effects with video editing software.

Remember the question about whether we should shoot with our frames sized to match our video resolution? In this case we would shoot as large a resolution as we can, which is usually going to be much larger than a video frame.

In your video editing application, rather than scaling your image to fit in the video frame, you leave it at full size, and then move your image sequence (which the application will treat as if it were a video clip) around in the frame. Your video frame becomes a “window” that lets the viewer see only a portion of the full frame at a time. As the photo-sequenced moves within the video frame it gives the viewer the illusion that you are panning your camera around in the scene. It won’t have the shift in parallax that would be seen with a dolly movement, but it can be good-enough, especially if you use it to emphasize the shift in movement around in your original frame. In your application, you’re looking for terms like movement or animation keyframes.



The original photos were shot at much larger resolution than the video frame

One other type of timelapse that is quite common is to mount your camera on a vehicle (e.g. your car's windshield), and then record a timelapse as you move around. The intervals for these kinds of work are often fairly short (on the order of 2 to 4 seconds) to keep the video flow as smooth as possible, but be aware that the video will still be quite bouncy depending on the movement of your vehicle.

Learn from the Mistakes of Others

There are several common issues the budding timelapse photographer will run into. If you know what can go wrong, you may be able to avoid these common issues.

FLICKER

The most common cause of flicker in timelapse video is due to changes in exposure.

This can sometimes be due to changes in the environment. For example, the sun was behind a tree or building at the start of your sequence when you set your exposure, but later comes out throwing unexpected light on your scene. There may be little you can do about this, but if you were shooting in RAW and have the exposure leeway in your original photos, you may be able to rescue your video using tools like LrTimelapse. You can also sometimes benefit with some planning for your shot, knowing the path the sun and shadows will take through your scene (tools like the Photographer's Ephemeris can help, which allow you to show the path the sun will take across your scene).

Flicker can also be due to changes in exposure in your camera. If you are using an automatic exposure mode like Aperture Priority, it's possible a short-term change in the environment caused the camera to change exposure for a few frames (glints of sun reflections off ripples in water or passing cars). If you are lucky, tools like LrTimelapse can massage those few aberrant frames to smooth out the look of your video. The better approach is to learn to shoot using manual exposure settings.

LEVEL PANNING

Most panning heads will turn at a steady rate (except perhaps super cheap spring driving ones), but only if their panning is on a level tripod/surface. If your tripod does not come equipped with a level for the head (not just the support joint), there are several

STEADY AS SHE GOES!

We all know the importance of a steady tripod during a long exposure. During timelapse work, it is also important to keep your tripod from moving for all the images in your sequence. Even very minor movements of the tripod can result in "shake" in your final video. Some video editors can analyze your frames and attempt to remove shake from your video — these functions are often referred to as "frame stabilizers"; they will slightly enlarge your frame, then shift and rotate each photo to keep them aligned in the video frame (the enlargement is to keep the edges of the photo from being seen on the screen).

Need Some Inspiration?

Here are some links to timelapse videos that you might find interesting and may spark your interest in trying it yourself. These links cover a variety of styles and techniques including traditional timelapse, but also dolly/panning views, hyperlapses, day/night/sunrise-set, etc.

- https://www.youtube.com/watch?v=_xMz2SnSWS4&t=11s — Vancouver City: Timelapse HD is a pair of brothers from Vancouver whom I saw speak at a photo club years ago. It was their talk (which included this video) that got me interested in shooting timelapse myself. One is an electrical engineer (who works in the movie industry I think?), and the other is a camera man for Global Television (or at least they were when I saw them speak). Between the two of them, they've created a lot of their own timelapse techniques (including shooting their timelapse frames in HDR — 3 to 6 exposures for each frame, to give the best exposure range possibilities in post-production) as well as invented equipment that commercial products took 10 years to catch up. One of their cutest gadgets was a “rail crawler” that they could put down on almost any guard-rail and use that as a dolly track. This video is one they did about a year or two before the Olympics came to Vancouver and was picked up by a lot of media sites as a promo for the city.
- <https://vimeo.com/45823951> — this short video shows the use of long exposure photography in timelapse. It also has a couple of spots layering regular speed video with timelapse.
- <https://vimeo.com/78978601> — Night Sky Cederberg: a series of night timelapse, featuring lots of moving star shots.
- <https://www.youtube.com/watch?v=Fk9EBOOAYiU> — The Sandpit: an example of timelapse using tilt-shift lens to create a faux-miniature effect.
- <https://vimeo.com/104515252> — Macro Timelapse: exactly what the title says, and example of timelapse using a macro lens and subject.
- <https://vimeo.com/231516166> — Nox Atacama: reputed to have some of the cleanest and darkest night skies in the world (altitude 16,000 feet, which makes for cold shooting), this video shows timelapse shots of the night sky in Atacama.
- <https://vimeo.com/64539316> — a timelapse reel of work by three photographers, featuring a number of techniques, including a lot of dolly work, Holy Grail shots, and night skies.
- <https://vimeo.com/63691010> — Ibiza Lights: a showcase reel featuring a number of sunset timelapses, lots of dolly pans, and night shots. Some night shots show the intriguing trick of shooting long exposures during the full moon, which results in a “sun lit” landscape with stars in the sky.

Resources

SOFTWARE

- Lightworks: <https://www.lwks.com>
- DaVinci Resolve: <https://www.blackmagicdesign.com/ca/products/davinciresolve/>
- HitFilm 4: <https://hitfilm.com/express>
- Virtual Dub: <http://www.virtualdub.org/>
- LrTimelapse: <https://lrtimelapse.com/>
- Image To Video: <http://en.cze.cz/limages-to-video>

SHOOTING RESOURCES

- Photographer's Ephemeris: <https://www.photoephemeris.com> (for planning sunrise/sunset, path of sun through sky)
- PhotoPills (Android App): <https://play.google.com/store/apps/details?id=com.photopills.android.photopills> pricy (as apps go) ephemeris including augmented reality viewing of your environment to see where sun/moon/etc. will be in the sky at a certain time.
- Sun Surveyor (Android App): <https://play.google.com/store/apps/details?id=com.ratana.sunsurveyor> cheaper than PhotoPills but with similar features, including augmented reality views to show the track of the sun and moon at your location (AR views require your phone have a magnetometer (compass) so it can detect the direction you are facing)

TUTORIALS AND INFORMATIONALS PAGES

<http://www.amazingsky.com/10-tips-for-time-lapse.html>

<https://prestonkanak.com/2013/06/12/how-to-shoot-day-to-night-time-lapses/>

<http://www.untamedscience.com/filmmaking/advanced-filmmaking/time-lapse-photography-guide/>

<https://vimeo.com/4212195> — using Virtual Dub to create a time lapse video complete with music soundtrack (VD is completely free) – I usually would only use VD to create the raw video, and that that into my slideshow software, ProShow, to create a full production with music, titles, etc. (or Premiere, or your favorite video editor if the one you use won't import image sequences)

https://www.youtube.com/watch?v=QpeUEK_5Tb0 — a video teaching how to create tilt-shift miniature timelapse by simulating the DOF effect of tilt-shift lenses in software. The teacher uses FCPX, but the same principles could be applied in Premiere, Photoshop, After Effects or many other video editing applications that allow you to apply blur effects and levels changes to video.