

Telling a Story with Light: An Interview with Bert Poole, DreamWorks Animation Studios

Q: What is your position at Dreamworks?

Bert: I'm currently a CG supervisor. I oversee the back-end production of sequences. On the technical side, I'm responsible for dealing with all of the logistical challenges as they relate to the complexity of a scene. On the artistic side, I'm responsible for the look of each of my sequences with my team of leads and lighters, providing guidance and presenting the work for critique and feedback from my production designer and VFX supervisor, as well as the directors and Jeffrey Katzenberg.



I've been working for Dreamworks for a little over 15 years. Lighting is my passion now. I really enjoy bringing together all of the elements and creating the visual style for a film. Each sequence is like a film unto itself with all new challenges and each shot within it contains both a visual and storytelling puzzle to be solved. My job is about creating compelling compositions while advancing the story. It's very fulfilling.

Q: How is light important in setting the mood of a piece or helping support the narrative of a scene?

Bert: Lighting serves two masters:

It is in service to story in that it conveys important information like the time of day or the mood at the current moment in the film. Color is an obvious example, where it can reinforce the emotional beats in a sequence. Reds convey passion whether it be anger or love, blues convey fear or sadness, yellow conveys nostalgia or sentimentalism, etc. A more subtle yet equally important device is the quality of the light. An overcast soft quality can convey either an apocalyptic or a mystical tone where direct harsh light can bring out action or comedy. The lack of light or playing something in silhouette can either create a feeling of suspense or help emphasize the action in a given beat.

Lighting is also in service to the readability of a shot or a series of shots. Each shot is a compositional puzzle. Given the space through and the time over which a shot takes place, you're determining where and what the audience will see. If it's a quick shot with a lot of action you may need to simplify the lighting so the basic shapes read quickly. If it's a shot where the character is delivering a key line, you'll need to be sure that the face reads well at the right beats.

The tricky part is that you're dealing with cameras, layout and surfacing that, when brought together, fight the two-dimensional composition of a scene. Through lighting, you can completely counter all of those other elements to make a more compelling composition. We use our core illustrative tools, the relationship of value, hue and saturation, to push and pull the viewer through the scene.

An example of knocking down visual complexity to create a strong simple read would be the sequence in *How to Train Your Dragon* where Hiccup finds Toothless for the first time in the woods. Throughout the sequence, we used pockets of fog and a diffused soft-lit quality to simplify the plants in the forest which could have easily cluttered the image. By grouping these using subtle value, hue and value relationships, we could direct the viewer's eye to the important aspects of each shot.



How to Train Your Dragon™ and © 2010, DreamWorks Animation LLC All Rights Reserved

In recent years, we've been looking to live-action films as a reference and incorporating filmic qualities into animation. The computer tends to generate a perfectly balanced image. With a camera and film, you get a lot of compositional help through the optics and developing process. For instance, in live-action film they'll often over-expose for a dark interior and as a result the exterior portions will wash-out, or in the case of a shot where the light-source is on-screen, they'll stop down the image exposing for the brights and as a result the fills will all get darker.

This simplifies and unifies areas of the frame which tend, as well, to not be the focal point of the shot. The use of atmospherics and depth of field are two other ways which we leverage off of what occurs naturally in film. By contrast, the computer offers none of these elements by default.

It's the curse of the computer: you have to be deliberate and take nothing for granted. I always tell artists to not let the machine dictate the image.

Another example I find myself running into on both *How to Train Your Dragon* and my current project *The Croods*, is having to consider the way live-action cameras deal with fire. Anytime you have onscreen



How to Train Your Dragon™ and © 2010, DreamWorks Animation LLC All Rights Reserved

fire in live-action film, you need to stop-down and expose for the bright parts of the fire, otherwise it completely blows out. As a result, other parts of the image drop with it because the shutter is much more restricted. This causes your mid- and dark tones to get even darker. In computer animation, we need to infuse the image with these qualities otherwise the fire doesn't feel bright. The audience is used to seeing it that way. So on *How to Train Your Dragon*, we had to expose-down anytime we had onscreen fire, especially in the climactic ending. As well, we'd desaturate other parts of the frame to make the fire feel that much more dramatic.

Using the filmic qualities simplifies and unifies areas of the frame. They become essential tools for us to use in creating the right mood and directing the viewer's eye. The use of atmospheric and depth of field are two other ways that we leverage off of what occurs naturally in film. By contrast, the computer offers none of these elements by default. Again, the curse of the computer.

Briefly, what is the process for lighting a scene?

At DreamWorks, we're sequence-based, where a sequence represents a portion of the film where a story point takes place, either across a single location or few locations generally with a single time of day. The exceptions are the difficult montage sequences, which involve a series of shots across multiple sets and/or lighting conditions.

It all starts with the colorscript for the film, which is typically generated by the production designer and VFX supervisor, with the approval of the directors and the studio. The colorscript is a series of thumbnails which represent the major environments and tones across the whole film. When the time comes for a sequence to go into lighting production, we have a sequence lighting launch where the VFX supervisor and production designer talk through the inspirational color-key work and/or film references as they apply to the important story-points of the sequence.

We'll talk through the quality of the light and motivating sources. At that point, the lighting leads will develop the lighting rigs to be used by the team, under the guidance of the CG supervisor. They work across the entire sequence in a shared inherited manner, doing a lot of the broad strokes lighting. In addition to the look of the sequence, the rig-setup also involves all of the logistical data-wrangling and management. This could involve anything from crowds to foliage to city buildings. The lighting leads are not only responsible for developing the look of these complex assets, but also in building the interface the lighters will use to interface with these assets. It's a very complex role requiring both technical and artistic expertise.

On some films, around the 25 percent lighting setup milestone, we will have interactive lighting sessions with the VFX supervisor to explore a few angles and develop the look of the lighting within the actual shots. This is a key step where we flesh out exactly how things will look using the real assets. Generally we use a streamlined rig for this exploration and it allows the creative supervisors to play a bit in the scene and see how things will really react. It's where theory becomes reality.

Once we hit 100 percent lighting setup, the team of lighters come onto the sequence and shot-lighting production begins. Using the rig provided by the leads, the lighters execute the sequence under the guidance of the CG supervisor who will bring shots into dailies with the VFX supervisor and production designer when feedback is needed or when we've hit one of our big milestone reviews. We generally try to get a final approval around the 75 percent point in the schedule so the final renders and technical fixes can take place. At that point, the VFX supervisor will do a grading pass in Nuke with the CG supervisor, the sequence will go to the paint fix department to fix small glitches, and finally to the digital intermediate for the final grade.

What are the different types of lighting situations and when might you use them to support different types of narrative content? (high key, low key, high contrast, low contrast, etc.)

Bert: High key often involves the quality of the light, where the scene is a bit more directly lit and shapes the character core areas. Midday lighting can be thought of as high key. Typically high key is used in situations when readability is important. For instances, comedy is one situation where a character's facial gestures are important. Action can also benefit from a high-key situation. High key is meant to overstate something. An example of high-key lighting would be the opening fight sequence in *Kung Fu Panda 2* where Po rescues the village. In that case, you can see how the comedy plays out easily amongst a lot of action.

Low key features a softer quality to the light. It's meant to be more moody or suspenseful, involving mystery, reflection or ominous tones. "Mystical" is another word which comes to mind. An example would be in *How to Train Your Dragon* when Hiccup encounters Toothless for the first time bound in ropes in the foggy forest. You can see how it creates a feeling of mysticism and suspense.

High contrast can involve high-key lighting, but it can also be characters in full silhouette in a low-key situation, such as in the wide shot where Stoick is hunched over Toothless when he fears that Hiccup is dead. In that case, it's high contrast because of the bright atmospheric quality but Stoick himself is in a low-key scenario where it's more overcast and apocalyptic in quality. The high contrast in that shot makes Stoick easily readable where we need him to read amongst a lot of debris and destruction from afar. The crowd is then entering from the right with the primary characters having a little more hue and value contrast making them the secondary read. Using the atmospheric also allowed us to desaturate the scene and diffuse the light giving it a soft quality for the tender contemplative moment.



***How to Train Your Dragon*™ and © 2010, DreamWorks Animation LLC All Rights Reserved**

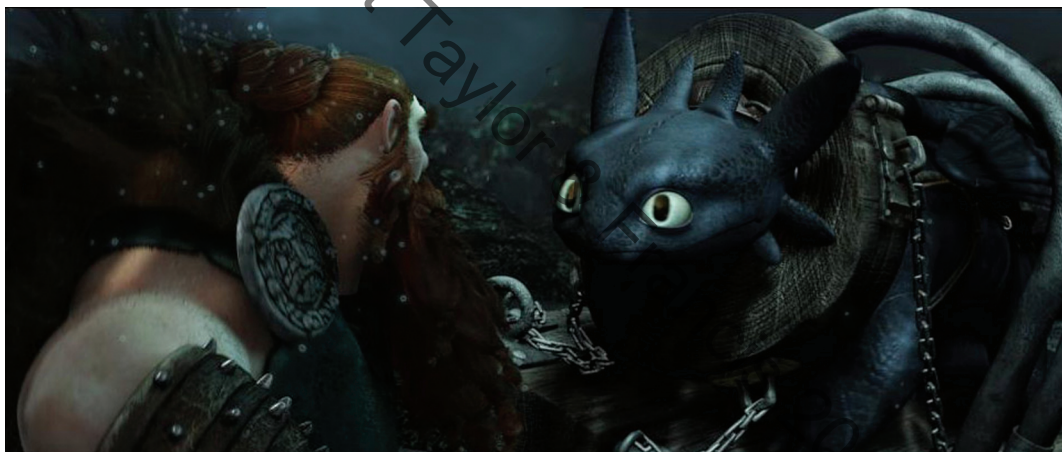
Low contrast is often used to play something down and is typically juxtaposed against a high contrast situation for pop and excitement. An example of this would be in the original *Kung Fu Panda*, the close-up on Tai Lung when he is waiting to escape his prison. As he lies in wait to escape, the lighting relationships are played down to help build the suspense and mystery. Upon his escape the contrast is boosted to emphasize the action and excitement, which also services the quick cutting action making things easily readable over just a few frames.

What are color keys?

Bert: Color keys are painted frames provided by the art department as a lighting reference for the look of a sequence. They're generally very coarse but they deliver the major color and tonal qualities of the sequence as well as helping determine the basic lighting direction and time of day. Because of the fact that they're painted prior to final surfacing or layout of a shot, they tend to be very broad strokes representation.

Why do you paint over frames in Photoshop?

Bert: Painting over frames helps us in a few ways. It quickly lets me play with the relationships in an already developed lighting-pass informed by the actual surfacing and camera. Quickly masking off and adjusting relative values can dramatically improve the overall composition of a frame. Often when we're not satisfied with how something is reading, rather than sending my lighter off on a wild goose chase, I'll open Photoshop and play around with ideas and in a matter of minutes I can find a potential solution. An example of this would be the scene in *How to Train Your Dragon* where Stoick frees Toothless from his bonds underwater. The sophistication of the metals and surfaces was creating a busy cluttered image and we wanted the interaction between Toothless and Stoick to read better. By bringing the frame into Photoshop, I was quickly able to knock down certain relationships and pull forward what I wanted to read. I found that the details within the metals and the ocean floor muddled the overall read of Stoick and Toothless.



How to Train Your Dragon™ and © 2010, DreamWorks Animation LLC All Rights Reserved

I often say that lighters want to make each asset look the best it can, often at the expense of the overall image. They'll make the best-looking trees or the best-looking rocks with very sophisticated surfacing and nuanced lighting, but those assets will often end up competing with the action in a scene. Sometimes you need to diminish the qualities in the surfacing to help create a cleaner image. Often times, squinting your eyes and evaluating the coarse value structure within an image can help reveal issues within a composition.

Paintovers are also a tool we can use when the production designer feels like we're not pulling things together and they want to give us a reference. This allows them to explore the image and gives us a quick turnaround.

On a final note, Photoshop can often help you to break your expectations of how an image should look. There comes a point where you become used to how something looks and seeing how it could be improved can become difficult when you lose that objectivity. I've often used Photoshop to dramatically change an image by shifting the levels radically and in doing so, it helps break how I'm used to seeing it. It helps me to stop seeing what it is and opens my eyes to what it could be. You never know what you're missing because you're approaching the image with an agenda and this process helps break me of that tendency.

Can you give some specific examples from your own work?

Bert: On *How to Train Your Dragon*, my lead was struggling to get the right feel to the underwater shots where Hiccup swims down to release Toothless. After several iterations, they were feeling a bit shallow and as a result it didn't have the feeling of danger that we wanted to achieve. By doing some exploration in Photoshop, I found a way to create a murkier deeper quality to the water which helped break the creative barrier for my lead.

In the sequence where Hiccup first brings a basket of fish to Toothless in the cove, the original concept was to keep the lighting by the shoreline in a softer low key and low contrast feel so that when they flew out of the cove, it was a bigger impact. While in theory, this worked well, the VFX supervisor and Roger Deakins, who was advising on the project, felt like we were using a concept that was delivering a weak composition. After playing with the image in Photoshop, they discovered that by adding some atmospheric and "exposing" for the dark conditions in the cove, the background could be brightened and washed out, changing the fundamental composition from a light on dark to a dark on light.

On the reverse shots where we were shooting away from the lake, the logic was flipped simply because it made for a stronger composition. The background was darkened rather than lightened, and the characters became a light over dark read. This goes to show that as long as the time of day and general tones feel similar, continuity can be sacrificed for the sake of a stronger composition.

What advice would you give to a young animator lighting a scene?

Bert: If you're sitting down to light a shot, there's a number of things to consider, but the ultimate question is: "What is the point of the shot?" I tend to think of compositions in terms of "beats" or "reads." If you had a character who had just opened a fortune cookie and upon reading the message realized his demise, the actual paper with the fortune might be the primary "read," the character's reaction might be the secondary "read," and the other contextual clues and environment contains the tertiary "reads" which eventually should lead the viewer back to the primary "read." These are classic illustrative principles. If you were to read the reaction first and then notice the fortune, it changes the feeling of the shot. If the scene is so cluttered that you don't notice the fortune at all, the character's expression may be confusing altogether. The length of the shot and the nature of the camera move are critical as well. If it's a short shot, you need to make sure it's a clear read. By leveraging the relationships between value, hue and saturation, you dictate where and what the viewer sees.

For individuals looking to advance their lighting skills, I have a few words of advice.



How to Train Your Dragon™ and © 2010, DreamWorks Animation LLC All Rights Reserved

My first bit of advice: The computer always gives you an image. Make sure it's the image you want and don't take no for an answer. Be deliberate and don't let the computer push you around. Make the image you want to make rather than being satisfied with what it gives you.

My second bit of advice is to never lose the trees in the forest. Many animators set-up a light rig and then render out all of their shots. Each shot is its own visual puzzle. Continuity, while important, does not justify a bad composition. Though live-action cinematographers start with naturalistic light based on a rig, they change it shot to shot, sometimes dramatically, to get the best composition and read. I'd suggest taking a few sequences from the great directors of photography like Roger Deakins, Robert Richardson, Janus Kaminski or Wally Pfister, and build a contact sheet of the shots. You'll learn a lot about how they compose shot to shot, where they choose to break with what would actually happen for the sake of a stronger read, and where they vary on even same-as shots where in theory nothing has changed.

If you really break down the shots, you'll see that lighting can actually change wildly shot to shot to the service of both the story and the composition. As long as the time of day and general lighting quality is consistent, and the story is compelling, the audience will buy what you're selling. It's not unlike a magician, who manages to keep you looking where they want you to look while they pull a rabbit out of thin air.

Lastly, use reference and study those who have gone before you. Study films and analyze both illustrations and some of the classic fine artists of the past. Consider how great filmmakers vary in their use of the medium. Reproducing work is a great way to wrap your head around someone else's art, exploring their choices. Challenge yourself to create a CG image in the likeness of your favorite film or filmmaker. Work from reference, either from photos and live-action film reference or from color keys you paint for yourself. If you're working on a film, consider making a thumbnail color script that explores the tonal changes across a film.



By simplifying the background into some large simple shapes through atmospheric, diminishing the material properties on the characters' armor and clothing, and downplaying the local color and saturation on the secondary characters, we were able to draw the viewer first to Stoick's eyes and then to Gobber's delivery before the viewer wanders through the rest of the frame.



Through depth of field and atmospheric, and by subtly shaping Toothless' head through the use of reflective sheen rather than direct illumination, we were able to draw the viewer into Toothless' gaze, creating a sense of intimacy.



Simply silhouetting and downplaying everything but the edge of the Monstrous Nightmare's head and Hiccup's hand with a soft off-screen bounce on the teeth created a powerful moment as Hiccup leads the dragon out of the stable.

How to Train Your Dragon™ and © 2010, DreamWorks Animation LLC All Rights Reserved

Copyright Taylor & Francis 2013