light that can be CT stable and cool. LED systems can provide all the advantages of fluorescent sources but also provide a degree of control not provided by any traditional lighting source.

[0575] In embodiments the LED systems described herein can provide CCT-tunable light, such as white light, such as for studio and stage light applications where lighting quality is very important.

[0576] Referring to **FIG. 108**, when several LEDs of different spectra are mixed to produce light, if the mixed light is not diffused properly, the lights can result in multi-colored shadows. This results from the mix of discrete light sources. The spectra can be mixed through diffusion media or translucent materials, bounced off of matte surfaces, directed through grating and holographic materials or used with optics designed to diffuse the light sources in such a way as to produce a good quality mix. Holographic films, imaging optics and non-imaging systems can all be used to provide this mix. In one embodiment, a system of LED sources can be combined with one or more of the above mentioned techniques for mixing the outputs to provide a uniform lighting source without the shadowing artifacts.

[0577] Most lighting analysis is done by using filters that match the human visual response. This response is termed the eye response or "Vee-lambda" V(lambda), but an alternative is to use spectral radiometry. Such spectral measuring devices are becoming smaller and less expensive and can eventually be incorporated directly into imaging devices such as cameras. A spectrographic device can be incorporated directly into an imaging device such as a camera (for consumer or commercial use). This spectral information can be encoded into the image and/or used to change imaging parameters.

[0578] In outdoor applications, very often the ambient light is insufficient or does not provide proper fill lighting for a subject or due to environment such as a snow background. Additionally, in imaging under trees or in the presence of shadows, it is often desirable to add additional lighting.

[0579] With the camera-based lighting control, such ambient light can be automatically adjusted to be equivalent to the ambient lighting or to be an offset color to provide contrast. In either case the color-controlled lighting provides means to augment the natural light or other light sources with a camera/computer-controlled lighting system **100** during the imaging process. The camera **10252** or other measurement device can read the outside ambient light and, once having derived that information, analyze it to determine what setting the lighting should be so that the color matches the ambient lighting.

[0580] Such lights can, of course, be controlled independently of the camera **10252** or a feedback sensor and adjusted until it 'looks' right.

[0581] Another embodiment is directed to systems and methods for using a portable touch pad or tablet interface for controlling lighting via an easy-to-use user interface. The tablet can display a simple color interface—perhaps the whole spectrum arranged in a suitably pleasing and intuitive manner. This would allow an interactive means to dynamically control lighting in a variety of venues including a photographic session, a concert, a club, events and gatherings. See **FIG. 109** for one example of a simple interface that can allow the selection of colors or effects based on a color representation.

[0582] A typical camera has a flash to provide illumination during the taking of an image. This is usually located, by necessity, close to the lens and often results in a 'flash' image appearance where all of the light comes from the viewpoint. In this embodiment, more than one such light can be made available for use in image taking by locating various LEDs on the camera body or attached to the 'hot shoe' normally used for attaching flash mechanisms. The existing 'hot shoe' can provide a direct mechanical and electrical interface to the LED lighting unit. The lights can be pulsed or sequenced in such as way as to improve image appearance, color or lighting.

[0583] In embodiments, lighting systems **100** including variants such as LEPs or OLEDS, can be produced in flat arrays, and a foldable structure **11052** can be used to make it amenable to packing and portability, as illustrated in **FIG. 110**. In embodiments such a lighting system **100** may have an integral battery, optionally a flat, flexible battery.

[0584] Referring to **FIG. 111**, additional control over the LED light output can be accomplished through the use of diffusing or polarizing materials **11152** to control light output and glare. These materials can be used in front of the lights as a diffusing medium and/or as a way to improve overall lighting through management of the light. LEDs, while a point source, can be used in arrays or as part of some new technologies in LEDs, provide flat panels that can illuminate through the use of variants such as LEPs or OLEDS. These sources can be used to provide flat diffuse illumination for these applications as well. In embodiments the lighting systems **100** may include or be associated with a phosphor material, such as embedded in a polymer, for converting the wavelength of light emitted by the lighting units.

[0585] LED prices have trended downward and the price and performance ratio is moving as rapidly as trends in the computer industry because LED materials and processes share a great deal with the computer industry. As a result, it is now possible to create a disposable camera that incorporates LED lighting as an illumination source. The LEDs can be pulsed above normal continuous operating limits since the lifetime of the LED need not be very long to be useful in a disposable application.

[0586] While the invention has been described in connection with certain preferred embodiments, other embodiments will be recognized by those of ordinary skill in the art and are encompassed herein.

1. A lighting system, comprising:

an LED lighting unit, and

camera, wherein the lighting unit lights a subject of the camera based on at least one of a desired lighting condition for the subject and a feature of the subject.

2. The lighting system of claim 1 further comprising a non-LED lighting unit.

3. The lighting system of claim 1, the camera further comprising a communication facility for communicating with the LED lighting unit.