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Visual Thinking/Visual Computing  
Field Integration Project

The object is a digital video camera. A handle on top allows the user to grip the camera from above and carry it, or one may choose to grasp its body with the aid of a hand strap. A mount on the bottom enables the use of a tripod. To view the video feed, the user may look through the viewfinder or on the LCD monitor. Upon this video feed, information is superimposed. This selectable data display can range from remaining tape and battery, centering guide marks, exposure time and white balance. This creates a digital interactivity to aid in producing the highest quality video possible. To replay what one has seen, the user may switch the power toggle into the VCR position, rewind the tape, and play back the footage an infinite number of times. The information is recorded through a lens, which can zoom into scenes up to twelve times their normal size. The light from the lens is focused onto three "CCDs," or charge coupled devices. The light is then translated into digital information and written onto a digital tape in either Standard or High Definition digital video. The objective world is broken down by the camera into 30 interlaced frames a second, each consisting of 480 lines of digital resolution. The camera is produced by Sony Electronics Corporation and is known by the model number "HDR-FX1."

Working with this camera is a joy. My reacting to it was initially positive, and now contemplative. Just 10 years ago, to produce a film of equal quality would cost \$50,000 in camera rentals, film, editing, and distribution. Now, at less than a tenth of that amount, I can shoot, edit, and distribute my piece through internet and DVD technology. The technology is compact, lightweight, inexpensive, and easy to use. Countless documentaries have arisen because of this new technology. Grassroots organizations can now fly to foreign countries and document political movements. Emerging filmmakers no longer have to adhere to the abrasive studio system of Hollywood. This technology democratizes motion pictures.

Computer graphics have played a pivotal role in the development of this technology in three ways. First, the research in computer graphics and encoding photorealistic images makes the interpretation from light to data possible. Video that is captured is initially large in size. Computer graphics technology makes algorithmic downsampling possible to maintain the integrity of the image while greatly reducing the amount of digital information it requires for storage. Technology from still computer graphics are utilized here to aid in motion capture and recording. Second, consumer computer graphics applications have enabled non-professionals to become image literate to video phenomenon. By understanding and navigating image manipulation programs like Photoshop, one can easily transfer ideas of hue and gamma to exposure and white balance. Third, computer aided design and manufacturing allows Sony to create a camera that is ergonomic, technically reliable, and operationally intuitive. The curves and joints of this camera remind the user of the vector splines used in creating computer graphics. The camera itself was probably modeled, tested, and altered using a mesh of nurbs to define its shape. This allows for industrial designers to reach their goal without going

through numerous physical trial and errors. All of these computer graphic related advancements enable users to easily produce video projects using the digital camera.

Delving into the field of semiotics, there is a major visual drawback to the use of digital video over celluloid film. There are three technical factors of this camera that produce semiotic disharmonies. Celluloid film is higher resolution, meaning more detail can be produced frame per frame since the recording is not digital. Digital recording is limited by cost and processing power. Also, the range of contrast on film looks much better than on digital video. Darker shadows and lighter highlights can coexist in a frame, where digital video attempts to be “smart” and balance the lighting out. Third, each frame in a film strip is a discrete object, being projected at 24 times a second. On video, because the image is refreshing at 30 times a second and using interlaced “fields” of data, the frames are inherently connected. These differences may seem strictly technical, but they have important semiotic implications. When a viewer watches a narrative film, she subconsciously expects to witness high resolution, cinematic contrast, and a certain frame rate. These factors together prime the viewer to enjoy motion pictures with such qualities. When the viewer watches a digitally recorded narrative, these semiological cues are missing, and the mode of viewing becomes different. Instead of understanding the video as cinematic, she is reminded of handheld home video with similar visual properties.

Putting a video camera in the hands of so many people has also created a new digitally literate class of non-industrial users. Cinephiles everywhere are now becoming computer champions by interfacing with cameras and venturing into the computer imaging arena. By wanting to produce a film, people are learning to navigate the digital design of the HDR-FX1. Operators play around with settings, menu navigation, and general operation, which helps them understand and utilize other digitally governed tools. After learning on a physical camera, the user then goes on to apply her newly learned digital intuition to navigating editing, compositing, and motion graphics programs governed by the same rules. Using a digital camera makes people think digitally. It makes them form inherent connections between computer based creation and visual communication of entertainment and social awareness.

These different perspectives make me view the object as a crossroads of so many different developments in recent history. By viewing the object from all these different angles, holding it in my hand gives me a feeling of deep responsibility. To communicate my own ideas and to enable others to do the same has become easier now than in any point in history. Years ago the pen was mightier than the sword. In the digital age, the Handycam is more powerful than weapons of mass destruction.



Camera on tripod



Information Display



Full Camera Body