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A Satire of Popular Science Media

The story for my movie is simple. I've done an off-the-cuff satire poking fun at sensationalized documentaries that channels like History or Discovery frequently film. The topic of my story is the physics behind black holes, which is a central topic in the recent film, *Interstellar*. All lines you hear in the movie were improvised; there was no script (forgive the frequent "umms"). All effects I implemented from our past labs that manipulate signals (audio or video) were used to enhance the dramatic effects of the movie. For instance, I created a sobel mask of the history channel to create suspense that is matched with the concurrent sound effect. Here is a list of times and what the effect is:

1. 14.3 seconds = Sobel Mask of History Channel Emblem (Lab 4)
    a. this was created with a non-linear edge detector. The equation that implements this process is: $s[n_1, n_2] = (x_r[n_1, n_2])^2 + (x_c[n_1, n_2])^2$. This is implemented in MATLAB by first creating a vertical edge filter: hr = [1,0,-1]; Which is then convolved with image "x" (a matrix) by: xr = conv2(x, hr, 'same'); then the vertical filter vector is transposed to create a hortizontal or edge filter by hc = hr'. Just like the vertical edge filter, the hc is conloved with x to create xc. Finally xc and xr are squared and added to create the sobel mask by sobMask = [xr.^2 + xc.^2] The image of this (imagsc(sobMask)) is what you see in the movie.
2. 1:54 = Denoised image of Cosmos : AS you can see, bigger blocks of color (i.e. lower frequency sinusoids in rows of the image) were passed through the filter, cancelling out higher frequency components. This was implemented in MATLAB via lab
3. 4:30 = Downsampling (Lab 7)
4. 5:15 = Upsampling - These were both implemented via a built in user-interface in iMovie, which presumably upsamples the image (and accompanying audio) in time to slow it down.
5. 6:25 = Reverberation of audio clip (Lab 3)
    a. The content of this clip may be unintelligible. I'm referring to the director of *Interstellar*, Christopher Nolan, who's known for his directing of recent Batman movies (e.g. The Dark Knight)
6. 6:45 = Frog sound notch filtered (lab 5), this was also upsampled in time to better hear the frog croaks (presumably in Kermit's pond).
7. 6:54 = NBC tunes created synthetically by damped sine waves (lab 2)
    a. These were implemented in MATLAB in which I looked up the frequency in Hertz of the NBC chime tones (in the octaves I felt appropriate)
8. 6:58 = NBC tune combined harmonics (1 through 20; from lab 1)
    a. the combination of harmonics sounded more distorted, which went well with the sound effects for the last slide. In lab 1 when we had 10 period of a "ahh sound" I

know had .8 second clips with 150 periods, and amended the matlab coding accordingly.

As the movie progresses, the satire intentionally becomes less subtle. The climax of the ridiculousness happens in the simulation of what lies beyond the event horizon. The researcher proposes that Muppets are new a fundamental force/particle of the universe that resolves problems in physics, maintaining the same professorial tone throughout his ludicrous explanation. Again, this satire is not poking fun at science of physics, but rather, at the sensationalism of some popular media outlets when they portray scientific material.