Painterly Rendering for Video and Interaction

This paper describes non-photorealistic animations and interactions, and has a goal of making tools to allow artists to create painterly animation and interfaces. Previous research has been done on generating representations of a painted world, or painted representations of a world. One approach attaches stroke positions and sizes over time to 3D geometry, while the other approach allows strokes to detach from geometry in space and time. The paper also extends the authors’ still image processing system to video and describes different masking techniques for reducing flickering in video.

I like how the authors described the advantages of non-photorealistic animations and interfaces. Some of the advantages include visual appeal, visual and emotional expression of physical media, informal interfaces, reduced requirements for geometric modeling and cultural references. Since the paper is about using non-photorealistic animations, it makes sense for the authors to discuss the advantages, but I believe they should also have discussed some possible disadvantages of this method.

One of the algorithms in the paper uses large brush strokes and then refines the painting with smaller brush strokes in regions where the painting doesn't match the source image. I like how the authors provided Pseudocode for the algorithm that does this. The Pseudocode is well written out, with definitions for all the variables, which makes it easy to understand, even for people that may not be technical.

Flickering, or static areas of the scene that are painted differently in each frame, can be caused in some of the videos. To fix this problem, the first frame of the video is painted normally while each of the other frames is “painted over” the previous frame. I like how the authors stated some of the problems that can still be caused by flickering when a static region of a video frame differs from the corresponding region of the previously painted frame. They did not only describe some of the problems, but also provided insights as to how they addressed these problems. For example, they performed difference masking (painting only portions of the video which contained significant motion). I think it would have been helpful if instead of providing mathematical equations as to how they altered the code in their algorithm, they had provided images of videos illustrating the flickering and images of another video showing how they tried to fix the flickering, just like they provided consecutive frames of a video using a constant optical flow field.

Section 5 is titled “Discussion and Future Work.” I believe that this short section seems more like a “Conclusion” section that briefly summarizes the paper. In this section the authors did not address any issues that came across their research, or any ideas for future work.
Telemurals: Linking Remote Spaces with Social Catalysts

The term media space refers to any environment created using video, audio and networked computers to support interaction between distributed groups of people. In this paper the authors focus on creating a media space to encourage social interaction. They do this by designing a series of catalysts that evolve with the interface. A social catalyst is basically something that initiates and creates involvement for people to engage with each other; an example of a social catalyst is a street performer. The social catalyst used in one of the media spaces is having images appear as graffiti in the environment. In my opinion, this makes the interaction playful and somewhat anonymous.

I like how the authors provide examples of the weaknesses of the current audio-video communication link between remote spaces. Some of these weaknesses include lack of privacy, gaze ambiguity, and the fear of appearing too social in a work environment. I think it would have been interesting to know if these weaknesses were just observed by the authors of the paper, or if they did some type of research that revealed these weaknesses.

I like how the authors provided background on the work of William H. Whyte on the social use and design of public spaces. This helped me understand what work has already been studied and what some physical challenges exist when designing social spaces. Also, in the summary section, the authors relate their findings back to William Whyte by saying that through their own studies, they also observed that what attracts people most is other people.

The authors tested Telemurals in the halls of MIT graduate dormitories. I like how they explained why each location was chosen. The authors wanted a location with a lot of traffic, public to the community, and somewhere where the large video wall would blend into the space.

I also really like how the authors explained their evaluation methodology. They evaluated the engineering, ethnography and design of their media space. Not only did they state what they were evaluating, but they also explained what each category meant to them. For example, in engineering they evaluated whether or not the system functions, in ethnography they evaluated how people used the system, and in design they evaluated whether the interface was easy to use and innovative.

I think that the “Future Directions” section was extremely helpful to understand what the authors want to improve in their current visualization. I believe that all papers should have a section like this, since in most cases there is always room for future research or improvements in a visualization. I agree with the Ethnography section that describes how it would be nice if they created Telemurals link between other sites to have more data to draw conclusions from. I think it’s interesting how
they are interested in having an outdoor mural; I’d be interested in seeing how an outdoor mural would compare/contrast with an indoor mural.

**Interactive Artistic Rendering**

This paper describes finding ways for non-artists to use computers to generate expressive images and scenes. Computers can be used to simulate handmade art through a technique called stroke based rendering. The program described in this paper allows users to control particle placement, size, shape and orientation, and to customize their artistic style by defining parameters such as shading models, texture and stroke styles.

I like how the authors give examples of related work that inspired their own work. For example, Meier showed that particle based brush strokes can be used to produce painterly renderings, while Kowalski used graftals (structures that create surfaces via an implicit model and produce data upon request) to render complex textures like fur and foliage on top of simple models. The work described in this paper combines Meier and Kowalski’s work by statically placing geograftal objects on a model’s surface, allowing users to edit the attributes of any geograftal to obtain control over the look and feel of the hand drawn effects that are produced by the system. I like how the authors mentioned that this system could also be used to create other hand drawn effects such as colored pencil, oil paintings, and pen and ink drawings. I also like how Figure 2 helps illustrate the concept of a geograftal as it is applied to a surface. This made it easier to understand what a geograftal is.

The paper states that when generating geograftal objects, there are two goals. The first goal is to simulate random placement over the surface of the object, to imitate hand drawn quality. The second goal is to have complete control over the placement of specific geograftals for special cases. The authors state that they achieve random placement on a surface by parameterizing the surface quadrilateral and then choosing random $U$ and $V$ values. The authors never specify what $U$ and $V$ values are, which made this concept difficult to understand.

I like how Figure 10 compares different line art strokes. It is very interesting how the strokes imply lighting in image b while they imply holes in image c. I also like how the authors provided other images to show how they can fix this discrepancy. Figure f shows how a scaling function can be applied to image b. I don’t think that an example of the scaling function being used should have been in a different Figure; I don’t think scaling relates to the concept of varying line strokes.

In the “Future Work and Conclusion” section there is one paragraph concluding the items discussed in the paper and one describing future work the authors want to do with geograftal rendering. I like how they provided a lot of different ways in which their research can be explored in the future. For example, user defined curves or bitmaps could be added instead of just having straight line curves.