Review of “Painterly Rendering for Video and Interaction” by Aaron Hertzmann and Ken Perlin

The paper presented methods for painterly rendering of videos. It is based on the methods developed earlier for the still images but used innovative techniques to minimize the errors occurring with the videos. One interesting point in the paper is the categorizing of the previous efforts in this regard as either generating representations of a painted world, or painted representations of a world. The first one attached stroked to the geometry over time while the second detach the strokes from the geometry. The paper followed the second method and kept strokes spate from geometry. The result is the change in strokes over time which gives some hand-made artistic effect to the video.

I also liked the idea of animating existing paintings and styles. This idea could be innovatively used in museums to give the viewers interact with famous paintings. This would thus encourage viewers to interact directly with the paintings, pay more attention to them and remember much more details about them. I think one good idea would be letting each viewer to change the original painting in way he finds more attractive. This would be a very good research idea to see how painter’s mind and public expectations would change over time. Viewers could even be given the opportunity of buying their final products and having a customized unique version of the original famous paintings.

The paper described the simplest method of generating painterly video as applying still image filter to each frame of the video independently. This benefit from the simplicity of implementation but at the same time lacks from the fact that subtle changes in the input would lead to flickering in the output. The innovative solution of the authors for this problem is to paint each successive frame over the previous frame. In other words, the painting of the first frame is used as the initial canvas for the second frame. The other innovative method to solve the problem with the videos is to use lower frame rate. The fact that frame rate of 30Hz video are too real that forced our mind to see the moving painting as an ordinary video with bad artifacts is very interesting. The authors reach the experimental value of 10-15 frames per second as the best value for solving the flickering problem. They were not able to find and scientific reason for this value but one interesting explanation could be the fact that our minds used to see hand-made animations at lower frame rates than videos. Thus, using the same frame rate as normal videos for painterly rendering videos would direct our minds toward viewing the video as a normal video while lower frame rate would direct our mind toward hand-made animations.

The other interesting technique used by the author is culling periodically strokes that are completely hidden. The technique used it to render every stroke with a unique color and determining which colors are not shown on the screen. Finally, the conclusion that users tend to use larger brush strokes during intense passages and mediated passages while smaller strokes are used in transitional passages was interesting. The fact that all the participants in the exhibition experience immediately understand and accept this process and spend many time to create various rendering of their own faces an bodies or just watch others doing this shows that the result of the system and the techniques used to create it are compatible with normal painter’s expectations.
Review of “Telemurals: Linking Remote Spaces with Social Catalysts” by Karahalios and Donath

The paper discussed the design and implementation of Telemurals which links remote spaces and provides a social catalyst. The paper started by reviewing William Whyte’s researches in 1969 and mentioning his findings and highlighting that he concluded triangulation as one of the key features of a successful public space. The term triangulation is used almost the same as social catalysts and refer to the events in public spaces that attract attention and facilitate communication among strangers. The author mentioned in addition on the most successful projects in this regard, Hole-in-Space and followed her experiment by implementing Telemurals. What I liked most about the system is the fact that speeches were visualized as text in the picture which makes the wall to be a motivation for interacting with others. One innovative incentive for the users was revealing more details when user spends more time interacting with the system. This is an excellent method which directs users towards a goal. They wanted to find out the limit of details and thus would spend more time with the system. I think one of the problems with other similar systems is the fact that they provide no ultimate goal for the users. Thus, they are usually seen as some interesting systems. So the users start using them but then leave the area after a while and the system lose its popularity very soon. This is the main reason that Hole-in-space has less attraction when it was working 24/7. However, it is not clear in the paper that what would happen if one of the users is active while the other is not. Does the active user see more details from both himself and the other person while the interactive users see minimum of both? What kind of effort is considered as being active? Is it only time spent in front of the screen or is it the voice or other actions performed? The other issue is how to inform users that as they spent more time, they would see more details. People would find the system interesting and spend 1-2 min working with it. Is this amount enough to inform users that by being more active they can see more details? Timing is a significant factors and the rate of adding more details to the screen would also be important. One other idea to encourage people to use the system would be to put random speech topic on the screen. Hot topics such as sport, music, university news or even events serving food on campus are good topics to start a conversation. I think this might be a useful idea to keep the system interesting in long term.

I think this idea could be expanded and many interesting applications could be built. One idea would be creating a restaurant with two branches in different cities. Each table could be divided into half while at one end there exist seats for guest and at the other end a large LCD exists. People who wants to have lunch together but are in different spatial locations could arrange to go to the restaurant at the same time. Then they can have lunch together and talk to each other exactly as they are in the same locations.

Finally, one of the concerns with these systems is the privacy. It would be hard for people to act normal in front of such systems although using abstraction makes them feel much safer. Wherever a camera exists, there always exist the fact that someone might be watching you and even if not all your actions might be recorded. It is hard to gain user’s trust with such systems and I think it takes time for people to trust a system completely. The fact that some of the users arranged meetings at each mural and calling each other on cell phones to verify the connection, reveals the fact that even the performance of the system could not be trusted without any personal testing. This is much more significant when the privacy came in. Even over times, it would still give negative impression knowing that there exist a microphone and camera around you even if high level of abstraction prevents your face and voice from being recognized by others.
Review of “NonPhotorealistic Rendering” by Gooch and Gooch

The paper described method for generating expressive images or scenes with a computer. The fact that when artists leave a scene incomplete, viewers become more involved since they had to use their imagination to fill in the details for themselves is used as the basis to develop algorithms for stroke based rendering by computer to create handmade art. I like the fact that the proposed technique associates particles with the geometry of subdivision surface models. Later, geografiales are associated with the surface rather than a texture and thus more than one distinct type of them could be applied to a surface. This results in the appearance of multiple textures on a single model which might be both interesting and useful. In addition, this is combined with the fact that objects moving away from the viewer have some of their geografiales shrink in size while randomly selected few grow in size. The result is more pleasant effect on the photo.

I like the fact that the proposed method used occlusion free lighting and simulated shadows with sources of negative light. This led to the fact that the value of the light at a surface point is only sensitive to the direction of the normal at that point relative to the light source. This described the shape of the object uniformly over the surface without regard to shadow. The fact that graffals are used as stroke objects to define texture leads to a texture that responds to light rather than view position. In addition the paper automatically generated a vector direction in which to draw strokes based on the two principal curvatures at each point. I think this is consistent with reality, since most of the time painters prefer to draw strokes following the curvature in order to show the fact that the covering texture does have curvature.

In addition, the system presented tone by the number of strokes drawn on each surface quadrilateral. Since only the lighting model affects the stroke index, viewport changes have no effect on the stroke drawn but the tone of line drawings is changed when the drawing is scaled. The system implemented this by using a scaling function that increases the stroke index as distance from the viewer increases. The paper pointed out that the result of this scaling function depends on factors such as the surface area of the polygons in the system, and the size of the viewing frustum relative to the stroke widths and objects.

Finally, the paper introduced to innovative solution to the problem that holes reveal in the model when the strokes are colored and thus no longer imply lighting. The first solution is to shade the underlying surfaces which are based on the real painting technique of laying down an underpainting to establish tone before applying detail. The second solution is to increase the coverage of the strokes on each surface in an equal way. I personally think the first solution leads to more interesting output since the strokes are hint of the texture and allow the user to complete the rest of the texture by inference. The fact that the implemented system renders at rates from 2 to 60 frames per second on a low end workstation makes the system practical for many of the normal users. However, beside all the mentioned advantages, the system lacks the fact that only straight line strokes could be applied. Further investigation is required to enhance the system to cover curved strokes as well.