

FLOW

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Abstract

Water is everywhere. It forms, gathers, and spreads through its multiple states: gas, liquid, solid. This generative artwork considers water across all the seasons of our world and our lives. The work invites the viewer to see, contemplate, and feel the lifeblood of our world. My *DadaProcessor* generative video system uses natural elements to weave its own flow - a stream of images. My system works in collaboration with Arne Eigenfeldt's *Musebot* generative audio system, which builds an aural soundscape that reflects and amplifies the artwork's visual presence. The result of their collaboration is *Flow* - a generative ambient video work of art.

1. Flow

Flow is an Ambient Video artwork produced by the *DadaProcessor*, my generative video sequencing system. The subject is water - the ongoing flow of water that defines our environment and feeds our lives. Water is everywhere. It forms, gathers, and spreads through its multiple states: gas, liquid, solid. This generative artwork parses water across time and space, considering nature's water across all the seasons of our world and our lives. The work invites the viewer to see, contemplate, and feel the lifeblood of our world.

The artwork has a flow of its own. It is a stream of water images, flowing across the video screen, accompanied by complementary flow of sound and music. Both the visual and sonic flow in this piece were created live in the moment by the two generative systems: Bizzocchi's visual *DadaProcessor*, and Eigenfeldt's auditory *Musebots*. Together they create a generative flow of image and sound that dances in front of us, showing the variety of moving forms presented to us by the water of our earth and sky.

The flow of water images across the screen is enhanced by the subtle internal flow of image transition. Each transition from one image to the next has a unique flow of its own, defined by the shapes and tones of the images themselves. The gradual change from one image to the next is unpredictable, fluid, and mesmerizing - reminiscent of the living visual flow of clouds, waves, or streams.

2. Ambient Video

Flow is conceived and created within the genre and aesthetic of "Ambient Video". The genre is sometimes called "Video Painting", and some ambient video works are positioned as "Slow Video". The genre of ambient video is a slow paced, generally non-narrative visual experience. The aesthetic and experience of ambient video is consistent with Brian Eno's formulation for ambient

music: it must be as easy to ignore as it is to notice.

I have made a series of linear (human edited) ambient videos. Consistent with Eno's dictum, I follow three rules for my ambient video work. First, I believe that an ambient video must never require your attention. Second, my ambient videos must always reward your attention with visual pleasure. Third, because they live on the ubiquitous video screens in our homes, offices, and public space, my ambient video must sustain its pleasure over repeated viewing.

Ambient video can take many forms. Some ambient pieces are graphic and abstract, such as those associated with the earlier "visual music" genre, or more contemporary computer screen savers or some VJ light shows. Other ambient video works are based in urban and human imagery, such as those in the emerging "slow cinema" movement.

My own ambient visual art is resolutely non-narrative. I believe that ambient art must leave the viewer free to leave the experience at any time of their choosing. Narrative, however, seizes and holds our attention. It is difficult for the viewer to escape from the experience – they are caught by the twin traps of character identification and narrative arc.

I respect that the viewer's attention is free to wander away from my work, but I do aim to reward that attention whenever it is bestowed. Some of this reward is because my work is based in nature. Natural content is consistent with the ambient, presenting a true alternative to our overwhelmingly urban lifestyles. Natural imagery gives us ongoing visual interest and restores our souls.

My images are also slow-paced. Fast cutting draws attention, whereas a slow editing pace provides an experience consistent with both the natural imagery and the overall ambient aesthetic.

The poetics – the design – of my ambient video work uses three artistic strategies to augment the visual interest of the natural imagery. First, I rely on strong composition. Due to the slow editing pace and therefore long screen time for each shot, composition and visual quality are a foundational imperative for my work. Unlike most documentaries, each shot must be able to sustain visual interest for a full minute. This is an extremely high bar. My videos therefore contain the work of many talented videographers, in particular that of my long-time Director of Photography, Glen Crawford. Second, I treat time as plastic, sometimes slowing the video (such as shots of moving water), sometimes speeding it up (shots of clouds for example). Third, I construct interesting and complex flowing transitions from one shot to the next. These strategies made me confident I was indeed creating ambient pieces that met my second rule: the provision of visual pleasure at all times.

However, when I was creating my human-edited ambient video pieces, I wondered about my success at meeting my third rule – sustaining the viewer's visual pleasure over repeated viewings. Despite the beauty of the shots, and the quality of the visual transitions, perhaps an ambient piece would lose its interest if seen too many times. I decided to see if I could build a computational system that would provide an ongoing stream of constantly changing video imagery. This

would become my generative *DadaProcessor* system.

3. Generative System Design

Generative artists create systems, and the systems create the artworks. My generative video system uses computational algorithms to select, sequence and present shots from a database of video clips. The result is an ongoing stream of video shots, with the sequence constantly changing and never (or very seldom) repeating itself.

The system contains a database of video shots. The shots are all nature-based, and are tagged for the content that appears in the image. The basic tags include visual descriptors such as: water, moving water, trees, sky, clouds, rain, snow, mountain, etc. Each shot also has a seasonal tag indicating time of year: summer, fall, winter, or spring.

Using simple editing rules, the system selects and sequences shots into an ongoing flow. The system presents sets of shots in seasonal order. For each season, three content tags are picked at random. The system then finds three shots that contain this tag. (The number of tags and the number of shots for the system to sequence are variables I can pre-select in the system software.)

The selection and order of shots changes constantly, but the grouping by content tags provides a reasonable amount of visual flow and semantic coherence. This generative logic is a recombinant aesthetic. New shots are not created, but the order of the shot sequencing is constantly fresh and changing.

Further variation is provided by the visual transition devices. Unlike most documentaries, there are no hard cuts

from shot-to-shot. The system instead relies on luminance transitions (based on brightness) and chrominance transitions (based on color) to go from one shot to the next. These transitions gradually play out on a pixel-by-pixel basis across the entire video screen matrix. The system has sixteen variations of these transitions, each one slightly different from the others. The system picks a particular transition for each shot at random. Since the transitions differ, and since video shots also vary in pixel brightness and pixel chrominance, the details of the transitions are varied. Each particular shot transition is fresh and unpredictable.

Since generative artists create art-making systems, the artists have to determine the type and degree of autonomy they build into the system. The goal of the *DadaProcessor* is to create an ambient work that will run indefinitely without repeating shot sequences and specific transitional moments. The increase in variation and replayability does come with a price - a loss in artistic control over the details of sequencing and transition.

One can see this as a tension built into the system. A linear video maximizes aesthetic control - the video artist carefully plans and executes the sequencing and the visual transitions. My decision to utilize random sequencing and randomized transitions has added variation and replayability, but has sacrificed a measure of creative control. The overall design problem becomes a subtle challenge - how to find the right balance between system autonomy on the one hand, and aesthetic control on the other.

Each significant creative decision in my generative design represents an attempt to find the appropriate place along this continuum:

system autonomy <==> artist control

My previous linear ambient art was situated at the far right hand side of this dynamic. The shot sequencing and shot transition decisions were locked in, maximizing artistic control over aesthetic impact. This may have included a possible cost to the long-term re-playability of the works in people's homes. In the linear videos my strategy was to rely on strong aesthetic control (careful shot selection, manipulation of time base, intricate visual transitions) to support a greater degree of re-playability.

The use of the generative database has increased re-playability through the strategy of recombinant computational variation, but the cost is some loss of detailed artistic control over shot sequencing and shot transitions. The challenge in this generative design is to find the appropriate compromise between system autonomy/variation on one hand, and the aesthetic reliability of the system's output on the other. I believe I have found such a compromise, but I am still tweaking the system to maximize aesthetic quality without sacrificing system autonomy and output variation.

I suspect that finding the balance between artistic control and system autonomy is central to the work of many generative artists in any medium.

4. Software

My *DadaProcessor* generative video system that creates the video is built utilizing Max/Jitter as its primary platform.

The system combines a database of video shots and the incorporation of basic film editing rules to create a shot list. For a given work, I define the tags used to describe the visual content of the shots, which are instantiated in the metadata tags added to each video clip. Tags may include objects (e.g., trees, river, waterfall, leaves), movement (e.g., waves, ripples, left, down), and color (e.g., red, green, orange). Other tags (such as location or season) can be incorporated as needed for different artworks.

The system also allows me to preset shot length, shot transition time, internal sequence length, and number of sequences for each iteration.

The system itself then uses its algorithmic rule sets to select and sequence the shots, and select the transition style for each change from one shot to the next. Special transitions are triggered by the end of a sequence or the end of a group of sequences that form a finished "piece".

Using this form of 'script', the system delivers the piece in real time to one or more displays. The system then automatically uses its rule-set to create a new list for a new piece, and the process is repeated indefinitely. Max/Jitter is relatively stable, and does not crash frequently. It can use its rule-set to autonomously output finished ambient video pieces for several days or even weeks.

The complementary generative audio system that creates the sound and music score for the piece was designed and built by Arne Eigenfeldt. It uses an iteration of his *Musebot* system, adapted

to work in real time with the *DadaProcessor* video system.

The individual musebots work as an ensemble to compose and perform a soundtrack that complements the video's sense of ambience and flow. Specific data tags and messages from the *DadaProcessor* send information to the *Musebot* system. This information includes video sequence and piece timing, as well as specific sound triggers for effects like water and birds to be mixed with the digital music.

For the Generative Art Conference exhibition playback, we have recorded the joint video/musebot system output as a digital file for onsite projection or viewing online.

5. Production Team and Support

My *DadaProcessor* generative ambient video system has benefitted from the work of many collaborators. Chief among them are generative audio colleague Arne Eigenfeldt, Director of Photography Glen Crawford, and Technical Director Justine Bizzocchi. Our work has been supported by the Canadian Social Sciences and Humanities Research Council, the Banff New Media Institute, and Simon Fraser University's School of Interactive Arts and Technology.