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# Ambient Landscapes

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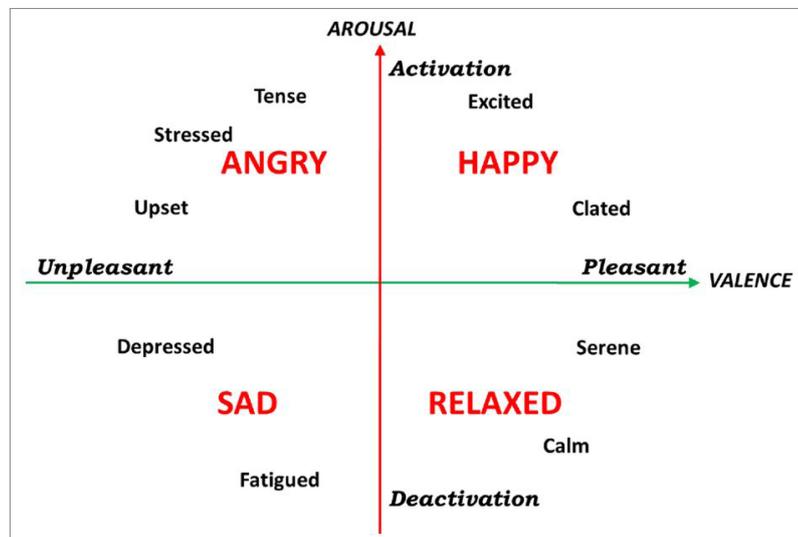
Ambient Landscapes is a meditation on our natural environment, inviting viewers to savour the passing of time over the course of the year. The system produces sequences of video joined by slow visual transitions and enriched through their interaction with music and soundscape. It is a real-time cybernetic collaboration between three generative systems: video sequencing, soundscape, and music. The computational processes run continuously, creating ongoing and varied audio-visual output for a single high-definition video stream with stereo sound.

## 1. INTRODUCTION

Art can clearly affect viewers and listeners in very emotional ways; however, artists will often reject the claim that the emotion is *in* the artwork itself, and instead insist that emotions felt are solely within the viewer / listener. How does one reconcile these seemingly opposing views? Efforts have been made to discover the relationship between emotion and music (Hevner 1937) as well as moving image (Cohen 2001); however, these studies have had limited direct application for the generative artist.

Russel's circumplex model (1980) introduced two very significant parameters for describing features that may produce emotional responses in listeners: *valence* (pleasant / unpleasant) and *arousal* (eventful / uneventful). These objective measures can be used both analytically as well as for generative purposes, primarily because such objective measures can be considered during the creative process. Artists can readily translate these measures within their medium: in music, for example, eventfulness can be translated as activity, and pleasantness can be translated as tension.

Fig. 1. Valence / Arousal model.



The circumplex model overlays emotional states on the two-dimensional scale (see Figure 1); significantly, these emotions result from the relationship between the two measures of arousal (or eventfulness) and valence (or pleasantness). Therefore, an artist, generative or otherwise, can create an artwork that has low arousal and high valence — two objective measures — and be confident that it will be perceived as “calm and relaxed”, two subjective responses.

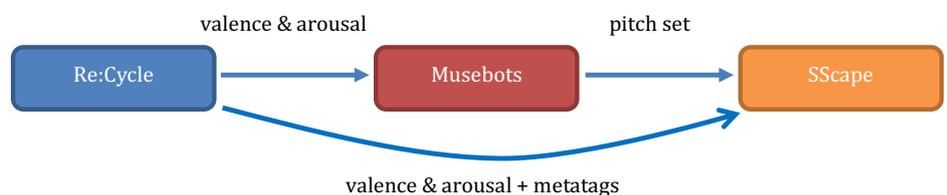
Within our multimedia installation, *Ambient Landscapes*, we are using these measures to drive the music and soundscape generating systems based upon an analysis of the video system's current output. The artwork uses visually evocative nature shots, and its goal is to support an ambient user experience that is calming and contemplative; as such, the values for valence and arousal in the video are relatively moderate.

## 2. DESCRIPTION

*Ambient Landscapes* combines three very different generative systems: video, music, and soundscape. In order to maximize aesthetic coherence and flow, the artwork relies on a chain of valence / arousal assessments and communications (see Figure 2). The chain starts with the database of video clips. The video sequencing system uses a set of content tags to select and order the stream of clips. Each clip has also been assessed and tagged by the artists for its valence / arousal values. This assessment is based on the artists' subjective evaluation of each of the shots.

The valence / arousal values for each selected shot are then sent to the two audio systems. The music system uses artificial agents, musebots (Eigenfeldt et al. 2015), to compose and create an original generative music track that reflects the valence-arousal values of the images. The soundscape system uses both content tags and the arousal values from the video stream to select and mix a soundscape that is consistent with the video and the music, selected from a large database of recordings. Lastly, the musebots pass their current pitch set to the soundscape engine, allowing that system to apply resonant filters to the selected recordings using the generated harmonies within the music.

Fig. 2. Metatag and Valence/Arousal pipeline between the video system (*Re:Cycle*), the soundscape system (*SScape*), and the music system (*Musebots*).



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