Mushi: A Generative Art Canvas for Kinect Based Tracking

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ABSTRACT
Using modern technology in the form of body tracking and real-time image processing software, we propound to contextualize abstract art with an experiential system. Overall, our goal was to capture something as ethereal and transitory as movement and translate it into a painterly medium.

Keywords
Kinect; Processing; Programmable Art; Optical Flow; Histogram of oriented Gradients

1. INTRODUCTION
A key means to stimulate a person's interest is to present them with interactions that continually provide them with fresh, creative interaction based on a framework of inferable rules. By combining the artistic styles of Pollock and De Kooning with the interactive nature of performance art, we hope to channel the emerging technologies of body tracking and image processing software into an experience that can engage viewers.

2. RELATED WORK
The amount of power the user has over the installation can vary based on its design. However, this does limit the range of what the user can create within a range of pre-programmed responses [1].

There are several levels of interactivity that an installation can possess. Installations can be dynamic, interactive, and varying. While any type of movement in an installation changes how the viewers will perceive it, an installation that can respond varyingly can create an individual, unrepeatable experience for the user.

3. DEVELOPMENT
This phenomenon was derived from Chamfer matching [2] algorithm with Lukas Kanade filters. This approach is used for object detection and to specifically identify these feature points from a human pose [3]. It determines average distance to the nearest feature using the following equation:

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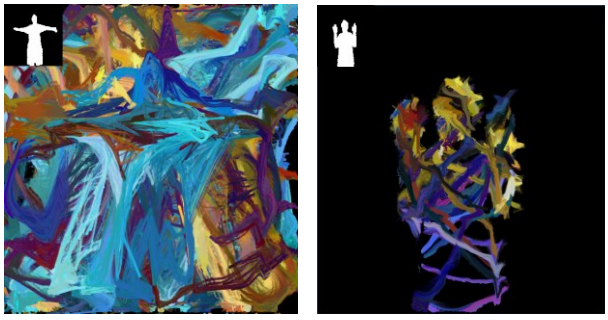

Figure 1. Abstract image modes being stretched and distorted in order to match silhouette of performer as seen by the Kinect

$$D_{chamfer}(T, I) = \frac{1}{|T|}\sum_{t}^{T} d_I(t)$$

where, T is a set of points that define the contour of the template, I is the image to search and d(t) is minimum distance for point t in some point in I. Any live feed is used as a template to these set of points and map a hierarchy of distance threshold. This information is juxtaposed with the brush strokes to give 2 modes as seen in Figure 1.

4. CONCLUSION
The plumages of color that our sketch generated attracted viewers before they even realized that it was an interactive piece. The piece contains a certain degree of abstraction, and this element of unknown helped prolong viewer engagement.

Going forward, we are interested in possible collaborations with dancers and other performance artists. There has already been some interest in combining the attributes of the Kinect with performance art in a Motion Capture stage.

5. REFERENCES
1.Francois, A., Schankler, I., and Chew, E. (2013). Mimi4x: an interactive audio-visual installation for high-level structural improvisation.*International Journal of Arts and Technology*, 6 (2).

2.Liu, Ming Yu, Tuzel, Oncel, Veeraraghavan, Ashok,Chellappa, Rama; Proceedings of the IEEE Computer Society Conference on Computer Vision and Pattern Recognition; 2010 p 1696-1703

3.Shotton, Jamie; Fitzgibbon, Andrew; Cook, Mat; Sharp, Toby; Finocchio, Mark; Moore, Richard; Kipman, Alex; Blake, Andrew, 2011, Real-time human pose recognition in parts from single depth images, CVPR, p. 1297-1304