




# Interactive Artist – Affective Painting in Multimedia Sensor Space

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**Abstract.** Non-arbitrary mapping of computer feedback audio and visuals to affect an artist/painter in performance aligned with human feedback loop closure is reported. Design related ‘bouba/kiki’ and ‘law of effect’. Results suggested higher unconscious than conscious impact to the artist during the process of creative expression. Performance process impact on creative expression by dynamic external stimuli on an artist is inconclusive from this explorative study.

**Keywords:** Afferent efferent neural feedback loop closure in performance

## 1 Introduction and Background Narrative

Computer software that empowers creation and manipulation of imaging is positioned from the perspective of two traditional artists (painters) so as to introduce this study.

A positive of digital software is exemplified by the history of an oil painter Jean Detheux<sup>1</sup> who became allergic to natural media and was only able to continue, reawaken and even develop his art via digital empowerment. This first with Painter in 1997 (Fractal Design/MetaCreations – later Corel), and subsequently, around the turn of the century, with Synthetik Studio Artist: Attributes of this twenty-first century product enabling even a ‘non-artist’ user to automatically paint, draw, and rotoscope, in other words, to create, have fun and experience a satisfying creative expression. However, such inclusive and accessible empowerment was considered negative and threatening by a Danish-based French painter Manu Rich<sup>2</sup> who is subject of herein reported series of studies.

In a meeting in 1999, artist Rich argued negatively against digital software such as Painter and Adobe Photoshop and the threat he considered innate. The author designed to counter by conceptualising how an interactive stimuli environment would affect the artist experience in a painting performance. The concept included with audience experiencing the creative expression activity. The concept related to the author’s body of work coined as SoundScapes where empowered gesture-based creative expression is used as a supplement to traditional rehabilitation intervention (e.g. Brooks et al. 1999, 2002, 2011).

Around the time of the meeting the author was invited to feature in the Danish NeWave festival in New York and a linked ‘going away’ party in Copenhagen. Behind

<sup>1</sup> <https://news.synthetik.com/tag/jean-detheux/>.

<sup>2</sup> <http://www.manurich.com>.

the invitation was that his interactive installation (see in following sections and online video<sup>3</sup>) had toured Museums of Modern Art and culture centres for near two years. Serendipitously, the invitation offered a timely opportunity to create and research the interactive painter concept.

## 1.1 Concept Foundation

This contribution reports on a three segment explorative study of non-arbitrary mapping of audio and visuals to affect a painter in performance. The concept aligns with the author's related research on human afferent-efferent neural feedback loop closure (Brooks et al. 2002, 2011).

The concept foundation related to audio-visual perceptual 'in-process' linking such as 'bouba/kiki' effect (e.g. Köhler 1929; Ramachandran and Hubbard 2001; Maurer et al. 2006). However, instead of speech sounds linked to visual shapes (i.e. the 'bouba/kiki' effect), this study focused on dynamic stimuli affecting a live painting activity by a professional artist who through his movement dynamics of painting, within a 'prepared' canvas sensor space, triggered and manipulated, thus self-effected, the external stimuli. The self-effective computer feedback interactions were speculated to affect the artist sub-consciously (thus, self-affect) and this was anticipated as being transferred to the creative expression (painting). Also speculated was impact at a conscious level. The author-selected content stimuli to affect, with changes made in real-time, thus the artist had no control of which sound was triggered. A speculation was that 'law of effect' through learning from the stimuli would enhance the artist's experience over time to indicate repeated pleasant consequences in the creative process behaviour and vice-versa (e.g. Thorndike 1932; Goodenough 1950; Kentridge 2005). Three studies were undertaken each resulting in a traditional painting on canvas – see Appendix 1–3 for images of framed pictures.

## 2 Venues and Overview of Design

### 2.1 Inaugural Event: Background/Overview

#### *Scandinavian Centre, Aarhus, Denmark*

Following the initial meeting with artist Rich, the author's Circle of Interactive Light (COIL) – an interactive large room-size installation that exhibited at leading Museums of Modern Art, City Museums, and main cultural centres throughout 1998 and 1999 – proved a suitable controlled location for the initial event. COIL was at the time hosted at the Scandinavian Centre<sup>4</sup> in Aarhus for approximately six months. It was a mature and tested installation where a live audience could be invited for 'special occasion' evening 'happenings' to experience a centre-stage meta-event and subsequently to experience the interactive spaces. The interactive painter was billed as such a

<sup>3</sup> <https://www.youtube.com/watch?v=3W4VznlgIU4>.

<sup>4</sup> <http://www.Scandinavian-Center.Dk>.

‘happening’. There was also a gratis café set up inside the installation to, as much as possible, ensure a catchment audience.

A large canvas was purchased, mounted and positioned with the artist’s paint and tools near to hand. Infrared sensors were mounted around the canvas to enable the sensing of the artist’s movements within specific painting spaces (e.g. tracking torso, head, limbs, brush strokes... within a volumetric space). Stereo speakers, MIDI and MIDI/DMX512 translator interfaces mapped sensed motion data to multiple unit auditory and lighting systems via computer feedback software (Cycling74 Max/MSP). Selection of auditory feedback aligned with ‘bouba/kiki’ effect referring to dynamic ‘rounded/jagged’ interpretations (e.g. at the extremes a smooth moving synthesizer patch versus a heavy aggressive Hendrix guitar style patch where each effected the painter to smooth and rounded expressions or jagged and aggressive expressions). A video of the event was recorded<sup>5</sup>.

See Appendix 1 for resulting painting.

An overview for readers is that COIL was created under the author’s ‘Ludic Engagement Design for All’ (LEDA) umbrella. This aspect of design targeted as wide as possible inclusion and accessibility for diversity across abilities, ages and situation (as aligned within SoundScapes - see Brooks 2011). Hence, the author-contracted agreement with all host venues included opportunities for Monday experience workshops. Monday being typically a museum’s ‘closed to public day’ where staff administration is undertaken. Institutions, communities or groups were promoted to contact the museum of their preferred Monday to book the author-led workshops. In this way wheelchair users or others with disability had freedom to experience without encumbering distraction from traditionally-abled, families, and others. Informing COIL design was a definition of diversity and inclusion from the American Alliance of Museums<sup>6</sup>. This emphasizes diversity as “The quality of being different or unique at the individual or group level” including “the perspectives of each individual shaped by their nation, experiences and culture—and more” and inclusion as the “act of including; a strategy to leverage diversity” whereby “to leverage diversity, an environment must be created where people feel supported, listened to and able to do their personal best.” Thus, fitting under this umbrella was considered the negative artist/painter as a unique individual whose difference was through opinion on the potentials of digital in the form of virtual interactive space (Brooks 1999). Through designing and hosting the interactive painter within the COIL installation the author was creating inclusion through the interactive meta-installation as discussed herein. Thus, interpretively, the interactive painter concept aligned with the author hosted Monday workshops at the museums.

Approximately thirty audience members attended the inaugural event. Many gave generally positive reactions following the event when asked open-ended questions. Some attendees even wished to purchase the created painting. This positive response however is lightly taken as attendees can be considered as mostly friends or associates of author and/or artist. It should be noted that the purpose of the ‘happening’ was not to appease the attending public.

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<sup>5</sup> <https://www.youtube.com/watch?v=K0I16Vih8Xs>.

<sup>6</sup> <http://www.aam-us.org/about-us/strategic-plan/diversity-and-inclusion-policy>.

## 2.2 Second Event

### *Life Nightclub, Copenhagen, Denmark*

The follow-up event after the initial COIL inauguration of the interactive painter was at a ‘going-away’ fund raising event towards realizing the Danish NeWave festival to be held in New York City, USA. The event was hosted in Life nightclub in Copenhagen and a similar interactive painter set-up was established, but with the addition of an invited heavy metal guitarist. The role of the guitarist was to offer another level of interaction for the painter who enjoyed heavy metal. The anticipated interaction did not result as predicted so the live musician was discontinued for the final event. A significant audience attended but this was not specific for the interactive painter aspect as a whole evening (and most of the night) was programmed for entertainment. There were insignificant interviews undertaken at this event.

See Appendix 2 for resulting painting.

## 2.3 Cumulative (Third) Event

### *Gershwin Hotel and Gallery, New York City. United States of America*

Located in the NoMad (“Noth of MADison Square Park”) neighbourhood centred on the Madison Square North Historic District in the borough of Manhattan, New York City, The Gershwin hotel (named after the musician George Gershwin; since 2014 rebuilt as The Evelyn hotel) at 7 East 27th St was frequented by a host of celebrities and was a culture hub with gallery space. The lobby featured original artwork from Andy Warhol and Roy Liechtenstein and each floor had a different artist or art theme. Figure 1, a painting by Andrew Woodward (many thanks for permission to use) illustrates the façade as the author recalls from 1999 and the Danish NeWave event.

The event at the Gershwin included a similar set-up as detailed in previous sections but with the addition of an author-design conductor jacket with strips of retro reflective material sown in the style of feathers over half of the jacket. The body movements of the artist wearing the jacket thus were enhanced through the augmented infrared sensor reflection of the jacket. This augmentation made the computer feedback system, via sensors sourcing the dynamic motion data, highly sensitive to change resulting in a more responsive feedback of stimuli.

An audience of around thirty attended. Immediately following the interaction event there was opportunity for the audience to ask questions. The questions exhibited curiosity, interest and confusion...and hinted at provocation and challenge as targeted under the research design. The performance event was subject to live streaming Online – something of a novelty in 1999 – though the author never saw the footage. Notable was that a group of Greek attendees positively responded by recommending contact to Jonas Mekas, ‘the godfather of avant-garde cinema’<sup>7</sup> who was based in New York running the Anthology Film Archives<sup>8</sup> where he is still listed as artistic director. The

<sup>7</sup> <https://www.theguardian.com/film/2012/dec/01/jonas-mekas-avant-garde-film-interview>.

<sup>8</sup> <http://anthologyfilmarchives.org/contact/staff>.



**Fig. 1.** Andrew Woodward, “Gershwin hotel,” acrylic on panel, 12 × 18” - copyright the artist and used with permission – see <http://www.andrewwoodward.com>

author followed up by meeting Mekas, however, his interest was solely on film medium and he had no concept of what was being presented as avant-garde interactive digital art. This is a side note of no value for this research publication, thus, not further reported and no disrespect is intended with this comment as the author valued the meeting and the positive recommendation by attendees.

See Appendix 3 for resulting painting.

### 3 Conclusions

A concept was conceived to affect a live painting event where the artist was challenged through a darkened environment, interactive multimedia stimuli, and live audience. Speculated was that the stimuli would affect the artist’s creative painting expression such that, at the extremes from an auditory perspective using physical modelled sounds, a heavy distorted Hendrix style sound would result in an aggressive highly jagged painting motion whilst a synthesizer pad sound would result in a smoother conjoined motion of creative expression.

A triad series of paintings were created upon three ‘prepared movement-sensing canvas’ performances under the author’s SoundScapes concept with different audiences in different venues and situation. The French artist Manu Rich<sup>9</sup> was the painter. A goal

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<sup>9</sup> <http://www.manurich.com>.

was to explore afferent-efferent neural feedback loop closure using dynamic stimuli feedback responding to human input i.e. a self-effect/affect loop (see Brooks et al. 1999, 2002, 2011).

Performances (all 1999) consisted of painter Manu Rich plus:-

- (1 @ Scandinavian Congress Center, Aarhus, Denmark – *Circle of Interactive Light [COIL] MoMA exhibition tour*) digital audio-visuals
- (2 @ Life Night Club, Copenhagen, Denmark – *Danish NeWave “Going Away” party*) audio plus live guitarist, and
- (3 @ Gershwin Hotel and Gallery, New York City, USA - *Danish NeWave festival*) digital audio via enhanced motion sensor wearable.

A live audience was in attendance at all performances and qualitative assessment was via observations and interviews. In addition, an audience Q & A session took place after the culminating performance in New York City (3). Outcomes from the observations and interviews are inconclusive as to whether ‘law of effect’ through learning from the stimuli impacted the artist’s experience or satisfaction. Likewise, it was also not evident whether behaviour followed by unpleasant consequences or dissatisfaction was not repeated (see Thorndike 1932; Goodenough 1950; Kentridge 2005). Auditory feedback was observed more impactful on the artist’s matching dynamics than mixed media, however this needs further investigation to claim with confidence. The ‘bouba/kiki’ effect was evident, through observations, in how certain of the artist interactions (beyond brushstrokes, as a variety of ‘tools’ were used) seemed to dynamically match certain feedback changes – especially if they were distinctly at either end of the auditory round-jagged stimuli scale; however, the artist’s conscious reflective experience in interview was inconclusive on this. Thus, it is difficult to ascertain the level of impact that the computer feedback (effect/affect) achieved if any. In other words, total closure of the afferent efferent neural feedback loop cannot be claimed. Related to the author’s main body of research however, there is alignment with potential unconscious engagement of the subject in responding to the stimuli that augmented the action behaviour. Further studies are needed, with possibly a number of artist/painters and with improved research protocol.

Notable is that even though the artist still gave indifferent responses when interviewed and in the Q & A session after the events, in 2008, almost a decade after the interactive painter series of events, he again ‘performed’ or ‘painted direct’ at the RATP (Régie Autonome des Transports Parisiens) Cultural Center – Paris alongside poetry by Paul Sanda and music by Damien Charon (see <http://www.manurich.com/biographie>). The 1999 events have not been discussed since as the painter returned to Paris following living in Denmark.

## 4 Coda and Future Work

What inspires an artist (e.g. painter, improvising musician, ...) to creatively express? What causes anyone to creatively express? Can such expression be empowering to a person? How does movement relate to creative expression? Can artist movement and

creative expression be influenced externally by non-related stimuli? Can afferent efferent neural feedback loop closure be identified and observed in an art-piece? Does it matter? ...

Movement related to creative expression is increasingly being investigated since sensor-based interfaces, microcontrollers, and computer advances are readily available commercially and affordable, in part, due to the adoption by games industry. Such interfaces were not as available in 1999 when this study took place. Thus, the bespoke sensors used in the author's movement research within disabled communities were used in this study.

This three segment explorative study of non-arbitrary mapping of audio and visuals (i.e. mixed media) to affect a painter in performance, although inconclusive, offered indications of the potential of interactive stimuli to painter performance. Such potentials are investigated in the author's main body of research titled *SoundScapes* where performance relates to functional ability. Potentials are also reflected as related to evidence in an independent randomized intervention study where a computer feedback product coined as 'Personics', which resulted from the author's research, was used to effect elderly patients in balance training where reported results were of a "marked improvement that was up to 400% in the training specific performance" (Hagedorn and Holme 2010).

In closing the author deems it necessary to state that, although the research reported was conducted in 1999, the questions asked in, and relating to, this explorative study are to a point still questioned nearly two decades later. But this could be a reflection of the author's naivety or, more recently, his distancing from the field. However, the undertaking and experience of showing his work at the Gershwin gallery as a performance research endeavour was rewarding. From this positioning, and as the text is closing, the author reflects on meetings and communications with the cited Montreal-based artist Jean Detheux who is increasingly acclaimed for his own improvisation concept of interactive painting performance with live musicians: Jean is probably the person who could get closest to answering some of these posited questions.

To end, it is reflected that the opportunity to realize such a study with three diverse venues in different countries, situations, and with a professional artist is rare. Thus, this contribution is shared almost two decades following the actual 'happenings' to promote similar studies where a student-reader researcher can reflect on the weaknesses of this research design to improve and challenge these and related questions on creativity, human expression, and stimuli effect/affect. Maybe a good place for them to start would be to query Mister Jean Detheux!

## Appendix 1



Painting result from segment 1 performance: Aarhus, Denmark.

## Appendix 2



Painting result from segment 2 performance: Copenhagen, Denmark.



## Appendix 3



Painting result from segment 3 performance: New York City, USA.

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