Alchimia: an Inexplicable or Mysterious Transmutation, a Seemingly Magical Process of Transformation, Creation, or Combination

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Abstract

Alchimia V2 is an interactive installation that relies on a single spectator/interactor standing in front of a screen/webcam. It has been coded in Processing 3.0 and is calculation intensive, using the webcam to perform facial detection, while simultaneously processing pre-prepared images and sounds, thus creating a virtual space of constant audio-visual movement to deliberately interfere with real-time self-perception and self-recognition. Alchimia V2 questions and changes our relationship with our own representation through the (ever present) camera and screen by focusing on the spectator's face, altering the expression, gender, assigning masks, making the facial traits diffuse, mixed, funny or scary, always mysterious, in a search for another "self", oblivious of the "selfie" pose and attitude, while allowing for self discovery and playfulness – or intimidation. Through the interaction the spectator/interactor is absorbed in the transmutation process, unaware of the fact that they also have become part of a performance: unique, unrepeatable, transformed.

Categories and Subject Descriptors (according to ACM CCS): J.5 [Computer Applications]: Arts and Humanities — Fine Arts, Performing Arts

1. Introduction

We humans have always been fascinated by our own reflection, and this fascination is expressed either by the very large amount of mirrored surfaces surrounding us, dating back to the myth of Narcissus, or artistic renderings – portraits of all eras – more recently embodied in the ever-present "selfie". A quick search for the hashtag #selfie on Instagram alone on the 19th April 2016 produced 286.291.353 results.

We are able to recognize countless patterns, and faces are among those that we easily detect from a very young age. But when it comes to acknowledging the public display of our image or portrait, we take extra care, we choose our favourable profile side, style our hair and may even use make-up products, either physical or virtual, with popular tools such as Photoshop or various apps available for most smartphones ranking among the most popular choices.

Countering the usual characteristics of a narcissistic personality disorder, which specifically implies the lack of empathy and the unwillingness to recognize or identify with the feelings and needs of others [BF05], how would the modern selfie-addicted audience react to an artistic stroboscopic [Arn54] rendition of their own faces, stepping out of their control while still clearly portraying them?

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How would they feel if suddenly they would gain traits of a different gender, age, race or culture? Would they strive to look for the *self* in the image or would they reject it? Would it bring out their playful nature or would it cause discomfort and scare them away? And what role would other stimuli – like audio [SU11] and text – play in altering their perception of such images?

These were the starting questions that drove me to create Alchimia V2, first presented to an audience in November 2015, during the opening of INVITRO, the transdisciplinary laboratory hosted by Universidade Aberta, CIAC and Artech International in Lisbon. The artefact was the result of a first experiment, shown at the Cerveira Art Biennial in July 2015 (Alchimia V1), where the interaction took place via a number of external sensors (ultrasound proximity, light and tilt sensors), but where the images were all pre-existing, thus allowing the viewer several degrees of manipulation, but no actual creation or visual input.

2. Figurative and Generative

The term "generative" usually implies an algorithmic structure that is followed for the creation of whatever output the artwork generates. The algorithm is then used to combine structure (order) with randomness (chaos) via dynamics, thus resulting in a seemingly infinite, non-repetitive variety of different states or combinations, but all within a certain aesthetic boundary defined by the artist / programmer [Dor13].

Generative art usually falls into the "abstract" realm, since the pure output of mathematical equations is seldom figurative [MBD*14], or directly representative of the material world, unless it relies on the use of sophisticated 3D modelling and animation systems, which will then be perceived as synthetic/virtual.

Keeping with the generative art tradition, Alchimia uses lines as the main visual vocabulary, but the most significant difference in design fell upon the introduction of randomness into the system, not just by pseudo-random number generators, but also by real-time facial detection – which causes factors such as scene illumination, distance from object to camera, size of detected face and position to influence the system in various different ways (size variation, color, spin velocity, z-axis velocity, etc.), yet retaining the most important traits that allow for self-recognition.

Figure 1: *Alchimia V2 run-time screen capture – by overlaying several iterations a sense of depth is conveyed.*

3. Structure and exhibition

Alchimia V2 receives input from two image sources: one, captured via a webcam, upon which facial detection algorithms are applied in order to extract a square subsection, which is then dimensioned to match the second image source – the "noise" image – a randomly picked image file from a pre-prepared selection of different faces and masks, covering a wide range of socio-cultural backgrounds, different geographic origins, gender and age. A real-time event driven soundtrack made of samples and loops is generated throughout the whole image generation procedure. The global flow is built as a crescendo, culminating in an audio-visual break, further punctuated by displaying a message over the images for the duration of the break. After the break the screen is cleared and the whole system resumes the generative processes.

One established premise is that the audience has little time to be engaged [GC10]. Alchimia V2 was designed to try and grab attention from the first seconds of interaction through three factors: (1) self-recognition – the viewer recognizes his/her representation through movement or expression; (2) animation – the images are constantly being redrawn and with the help of auxiliary lines the whole screen area is flooded with movement, albeit soft and iterative; and (3) revelation – by presenting a textual teaser at the specific moments of culmination, thus defining a cycle. By recording a frame for each cycle, the artwork was then optimized by adjusting several parameters: a larger number of consecutively recorded frames of the same interactor defined a measure of success.

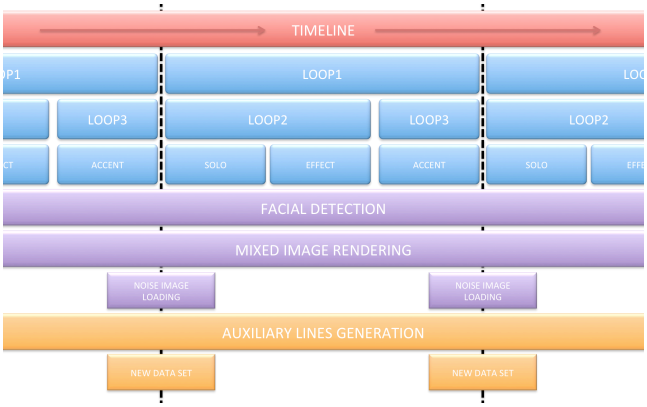

Figure 2: *Run-time schematic, continuous looping.*

The viewer/interactor is engaged through an immersive build-up within the cycle, by stimulating mimicry – of the "noise" images – and curiosity, as well as self-observation, and rewarding progress at the end of the interaction cycle. The direct relationship the artefact establishes with its current viewer/interactor by means of the webcam and screen creates an individual space/experience, but by means of a large-size projection it can create diversion and entertainment for other viewers, for whom the real artwork/performance is the actual interaction taking place between artwork and viewer/interactor.

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