

## The Portrait Machine

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### Premise

This project is a two-way experiment. Firstly, it explores how a generative art system can relate to people; and secondly, it explores how people in turn relate to the system and to digital art works in general.

It is often remarked that some portraits 'bring the sitter to life', and others are lifeless or flat. The Portrait Machine is an attempt to find out why this is, and whether artificial intelligence can influence the effectiveness of a generated portrait. Volunteer sitters (conference attendees) are photographed, and then the images are mixed and detoured by a generative art programme, to produce an image which is given to the sitter.

The system analyses visual and behavioural data it has observed about the sitter, and attempts to situate the sitter within the 'big five' personality scales, which are commonly used by researchers and psychologists to make basic character assessments. The image is then generated using these scales to influence the generative process. Does this make the resulting portrait more or less effective? Limited evidence suggests that it may do so.

The system is also an experiment and a performance. I will make portraits of anyone who wishes to take part. Every volunteer will receive one or more of these images of themselves, including copyright and full ownership of an original graphical art work (in the form of a .png file), if they wish to do so. Limited evidence suggests that those who enjoy digital art do not think primarily in terms of legal ownership or financial value.

## 1. Introduction

This paper and demonstration will be a small-scale social experiment, to see how conference attendees respond to direct involvement with a generative artistic process, and how sensitively the process can respond to them.

Throughout the GA2017 conference, for example during refreshment breaks, attendees will be invited to have portraits generated for them, pavement-artist style, but by my laptop. These will combine images, live feeds, and random elements, into a composite 'interpretative' portrait in their environment at an instant in time and space.

Several portraits can be generated for each sitter, who can select one, which will be given to her or him, in the form of .html or .png code emailed to them, or downloaded to a memory stick the sitter supplies.

The objective of this process is to examine the ways in which a machine can relate to people, and people to a machine and its products.

## 2. When is a portrait 'successful'?

Portraits have been a staple of art for a long time, though traditional artists lost their monopoly after the invention of photography. For a human to paint or draw a good portrait demands a high degree of skill. Yet it is quite difficult to evaluate whether a portrait is 'good' or not.

Kant held that art was disinterested – that we have no desire to make use of the art work to a further end, but only wish to contemplate it. [1] Portraits are perhaps an exception to this view, since they serve not only as mementos of the sitter, but also as explanations or impressions of their deeper character. Photography allows us to make more or less accurate records of the shape of a face, but it seems generally to be agreed that not only painted but also photographic portraits differ in how well they 'explain' or elucidate the sitter.

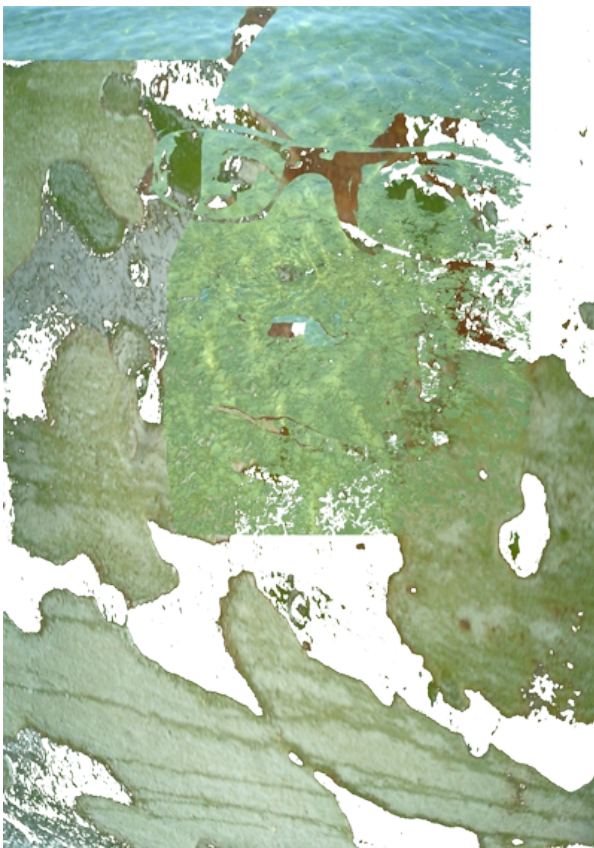
Classical views of art make much of a painter's ability to 'interpret', rather than just represent, the sitter. Henry James spoke of good portraits having "the quality in light of which the artist sees deep into his subject, undergoes it, absorbs it, becomes patient with it, and almost reverent, and, in short, enlarges and humanizes the technical problem". [2]

The really good portrait, in other words, might be said to combine an accurate record of the shape of a face, a set of psychological insights, and the 'disinterested' aesthetic appeal of a beautiful object.

Photography is generally thought to produce an accurate record, though of course this can be distorted in many ways.

But can an artificial system produce psychological insights? If a real artist were painting the sitter, he or she would rely on a brief acquaintance, making judgements based on the sitter's appearance, manner, conversation, and so on. These judgements would then have an impact on the way the artist painted the portrait. The Portrait Machine attempts to mimic some of the observations that the artist could make during a short acquaintance with the sitter.

Whether the system can produce objects with 'aesthetic appeal' is a difficult question, which is not covered by this paper. There is much controversy over 'beauty', and whether this is an absolute quality or simply a set of social conventions. Perhaps it is a personal decision whether some of the images produced 'look good' or not. Two examples produced by The Portrait Machine are offered, so the reader can decide.



### 3. Gathering data about people: the 'Big Five' traits

When someone volunteers to act as a sitter, three photographs are taken, using a webcam. Two of these may be used in the portrait, the third, of the sitter's clothing, is analysed by the system. The system also observes the sitter's behaviour both during

the sitting process, and in a simple task. Visual and behavioural measures are made from these observations.

The analysis is structured around the 'big five' personality traits. According to Gosling et al, "The Big-Five framework enjoys considerable support and has become the most widely used and extensively researched model of personality." [2]

The 'big five' scales have been summed up [3] as:

**E - EXTRAVERSION, ENERGY, ENTHUSIASM (I)**

**A - AGREEABLENESS, ALTRUISM, AFFECTION (II)**

**C - CONSCIENTIOUSNESS, CONTROL, CONSTRAINT (III)**

**N - NEUROTICISM, NEGATIVE AFFECTIVITY, NERVOUSNESS (IV)**

**O - OPENNESS, ORIGINALITY, OPEN-MINDEDNESS (V)**

Suitably re-ordered, they offer the mnemonic OCEAN. Psychologists see them as the most significant characteristics, and measure the extent to which any individual subjects exhibits each characteristic. Measurement is normally done using questionnaires or interviews.

The core of The Portrait Machine is an attempt to use its own measurements to place the sitter on the OCEAN scales.

As an example, the sitter is asked to write 'three sentences', in three boxes on a form. (No further explanation is given.) When the sitter presses 'enter' on the form, the system looks only at:

1. the number of words and characters in each box
2. the timing with which the sitter writes in the boxes (eg do they go back and correct themselves? Do they take longer over one box than the others?)

The system scores the complexity or simplicity of the sentences (long sentences with long words, or short sentences?). It also looks at the comparative lengths ( is one sentence longer than the others, or are they all about the same). It also looks at the fluency with which they entered the sentences, whether they hesitated or not, and whether they went back to make corrections. The actual 'content' of the sentences, or indeed whether they are grammatically sentences or not, is not noticed.

As a second example, the photograph of the sitter's clothing is analysed to identify

- colourfulness (eg how many colours are used)

- saturation and brightness of colours

Once these and other 'scores' have been built up, they are translated into assumptions on the 'big five' personality scores, using a matrix. This matrix is to some extent arbitrary, but in many cases the links between observations and the Big Five types seem justifiable. For instance, someone who goes back and corrects 'sentences' scores more highly on 'conscientiousness', although a sitter who makes a large number of corrections scores lower on 'emotional stability'. Someone with brightly coloured clothing is judged more likely to be extraverted, and so on.

This is not meant as a serious psychological evaluation. It depends on many assumptions. However, from it the system makes a guided but random selection of colours, layout, background, other images and so on, designed to express or embody this mix of personality traits.

### **3. How does the system turn analysis into an image?**

The Big Five 'scores' are used to provide a set of instructions to the drawing software, and three images generated. The generation process involves

1. overall composition of the image. The system chooses from several 'wire frame' templates, controlling the complexity, symmetry and balance of the final image.
2. selecting none or more from a library of background images.
3. blending the selected images with one or both of the webcam images of the sitter, which are placed in the selected template.

All these decisions are taken by a set of algorithms, which attempt to match OCEAN characteristics to the image being generated: for example,

1. how many images are to be used? (Conscientiousness, constraint/ openness, originality/ energy, enthusiasm, ).
2. How balanced should these images be? (Conscientiousness, control/ neuroticism nervousness ).
3. Should the colours be bright or dull? (extraversion, energy/ neuroticism, nervousness/ openness, originality)?

The matrix which controls this process is in a sense the heart of the system. It is partly controlled by observations, partly by random selections within categories selected after observations, and partly on a totally random basis.

### **4. How do people react to the system?**

The other half of this experiment is to see how humans react to the machine.

The first observable variable is whether individuals allow themselves to be portrait subjects at all. At conferences such as GA2017 one would expect a degree of

openness towards a generative art work, but sometimes people have other calls on their time.

The process takes two or three minutes, which allows time for a short semi-structured interview. This second set of inputs is designed to elicit the value sitters place on digital art. Have they been to recent exhibitions? Do they own digital art works? How familiar are they with the field?

The third variable comes when the system generates three portraits, and the sitter is invited to choose one or more that most 'captures' his or her personality. Of each group of three images, two are based on a psychological assessment, but the third is based on a deliberately different assessment. (The 'wrong' score for that sitter.)

My theoretical assumption is that the more one or two images stand out from the others, the more likely it will be that the system is demonstrating an effect. Of my small sample in early experiments, about half asked for all three, but the remainder showed a clear preference for one or two of the others and a clear rejection of the third.

The selected images are then emailed to the sitter. As a final variable, the sitter is offered a 'certificate of ownership' of the image as an original and unique art work. (Should I ever become a 'hot' artist, it might command high prices!). This is designed to test the extent to which sitters place monetary value on digital or generative art works. I am glad to report that so far most sitters have initially been puzzled at the concept of having 'ownership', let alone sole ownership, of a digital art work. Few actually 'possessed' any such works, except those they had made themselves, and few thought of these works as having any monetary value.

## 5. References

- [1] Kant, I, 'Critique of Aesthetic Judgement', quoted in Sheppard, A, 'Aesthetics: an introduction to the philosophy of art'., Oxford University Press, 2009
- [2] Ron, M (1985): "The Art of the Portrait According to James" Yale French Studies, No. 69, pp. 222-237 Published by: Yale University Press Stable Accessed via <http://www.jstor.org/stable/2929937> in March 2017
- [3] Gosling, S d, Rentfrow, P J and Swann, W B (2003): " A very brief measure of the Big-Five personality domains", Journal of Research in Personality, 37, pp 504-528.
- [4] John, O. P., & Srivastava, S. (1999). The Big Five trait taxonomy: History, measurement, and theoretical perspectives. In L. A. Pervin, & O. P. John (Eds.), Handbook of personality: Theory and research (pp. 102–138). New York: Guilford Press.