Meredith Davey
Context Paper – Draft

SAP[illegible] a new approach ..

Mathematics by itself is indeed an art, but it's direct transl[illegible] not necessarily result in art o[illegible]n By Numbers[1].

Historically there has alwa[illegible] link science and art. In the classical periods there was a[illegible] the philosophers thought about art and their view of th[illegible] corporate a mathematical view to greater understand i[illegible] Pythagoras essed with the nature of numbers and their link to ar[illegible] music ways his creation of the Pythagorean triangle[i] was the[illegible] s could get seeing to the face of god. Őzcan and Akar[illegible] sserted that aesthetics is based on logical forms and tha[illegible] geometrical ere "forms of beauty"". [2]

In the renaissance times it wa[illegible] e by the works of people such as Leonardo da Vinci w[illegible] himself as a scientist for the majority of his career. Ano[illegible] cking he painted arguably the best figurative portraits i[illegible] gelo designed St Peters basilica (at that period an exe[illegible] skill to achieve the dome dimensions) as well as being [illegible] mathematical ratios were applied thought the renaissan[illegible] in the arts. For instance it can be demonstrated how he[illegible] Michelangelo used the golden ratio in t he design of Medici Chapel[3]. At t[illegible] science and art was still a unified field and people would take as[illegible] into their works.

Even outside of the context of[illegible] renaissance man r the classical philosopher there was still broad overla[illegible] disciplines eibnitz and Newton are extraordinary examples of this[illegible] pendently calculus, one of the most important achievem[illegible] man. Both of these men transcended their fields, New[illegible] of the British Parliament and Leibnitz devoted a large [illegible] plomacy "*his manuscripts addressed a broad range of s[illegible] theology, politics, political and economic history, archite[illegible]*[4] The interesting thing to note about their differing deve[illegible] technology Calculus that while Newton used it more effectively to create a[illegible] n laws of physics) an is generally considered the first[illegible] ibnitz notation is the type that is commonly used fo[illegible] aesthetic reasons oth typographically and mathematically.

In recent decades there h[illegible] separation sciences to the arts, stemming from the speci[illegible] tion started. It would not be unexpected to[illegible] art gallery or an

[i] A Pythagorean triangle is a right angle triangle where the sum of the square of two sides equal the square of the hypotenuse. $A^2+B^2=C^2$, this only occurs for specific integer numbers.

artist to have not studied any sci ics of maths needed to operate in the moder

Someone sciences beauty aths and ct e artist sciences intrigued ad of shying a th an educational separatio institutions tend to teach these ideas as concur concepts differing fields that have no relations leading the individuals way.

orthwhile question asking when or why this separati exists op t will not significantly help to resolve the problem of th s separation. It is more portant to realise that this situation, and problem, ways t counter the issue instead of spending time trying how this occurred.

Recently people and institutions have been trying to remedy this issue the implementation of multi- or cross-disciplinar The Bauhaus the Ulm[5] institutes were both working on th of quantizing the artistic process or Other examples academic scientific departmen resident artist's presence My undergraduate physics de stance, had a resident artist across in that environmen

But thi t. There needs to be a visu language formed from math here is common ground to art and design. The creation of a hybrid child between art and science, without ate that there is more common ground tly acknowledged.

Computational naturally tends towards this process, and in itself can be demonstration of mathematical elements as computers purely carry out mathematical unctions and then interpret them by logical rules to create images Computational essence is one of mathematics demonstration of how maths can be interpreted

visual design and scientific there is potential for this medium to demonstrate using a tool that is native to both reduce risk work that alienates audience by selecting a tool that they are not familiar with, the lack of familiarity changing their focus on the work.

This thesi analyse the interface between art and science ough the use of digita design media and Art; a *Design* Interface (SADI) interface will consist computer progra numerals and equations entered ating graphi typographically different potentials data n be interp nation density con dynamic process here can drawn to the work of J gine, trans to a subject matter or math and s the basi program as follows "*The user can en edit text, adjust static and c layout, apply dynamic and interactive behaviors, and adjust their par with a common set of tools and a comm interface.*

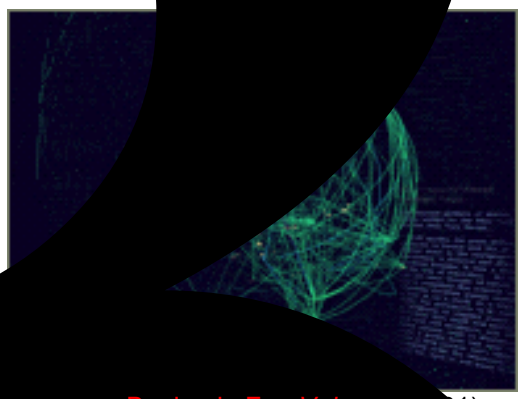


Fig. 1: OBX Labs, Parting T Benjamin Fry, *Valance* 1)
giver text
An example of the use of Lewis's TextEngine

There are also links that can be drawn to the works student a MIT, who has developed a system called *Valence* to analyse structure of information deep systems. Also there are the Peter Cho who uses dynamic typography to examine the way the text is read

This project is founded on the gap between disciplines, s digital media offers a new ground to bridge the divide between ar science there has been growth to link the disciplines of science a art link of knowledge exchange as scientists and most art derstanding of the other discipline. This thesis and pro will act to show that there are ways to have a scientific principle/meth e ered art or design and thereby demonstrates com ground useful to both ciplines.

Central to this project is the choice of subject hy and numerals ch are largely looked as having fun properties ather then creative challenge this perception by n numerals in

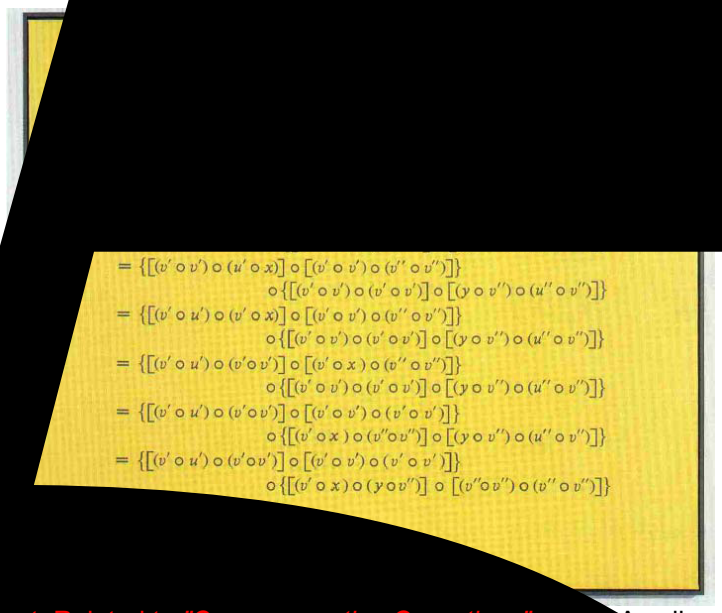
an inventive and dynamic manner. This kind of research integral to understanding our human and digital landscape.

Mathematics is the corner stone of the hard sci oes further into pure mathematics that is beyond the scor of this project ecause this area holds not interest or is not worth explo this thesis it holds less interest then the applied for mathematics hysics, for example. This decision is one of prac the more applied side of pure sciences it is ation in a demonstrable manner that is likely ther then a higher order process that is diffic vey t udience let alone someone not schooled in t.

Only by presenting this proc al to that o scientists mind a visually appealing and interesting ll this kind c en as more then just a thought proc veyance of in ess will be shown to be the art fo .

This is a different process that which has rece athematical representations ently the focus has be ordering of patterns that have only sible to visualise throug computers ly fractals. While there debate about whether these ima art or not [10] from this thesis's p they are ultimately un-inte no insight into the process mathematics, but represent a specific visual on of it and have historical terest as some of the first m ations that wou not been possible without compu hn Maeda de tals as "*primarily the selection of p ets*"[11].

times that math has been used in a used as a ictorial or typographic medium; this can ks of Anna Bliss , Berner Venet[13] and Mel Bochner[14]. In Windows 0) by Anna scientific images/typography Bochner writes numerals in To Count: Intransitive use maths in this creates barrier between audience used only because of this barrier could be augmented to perform the same visua appearance vould allow the audience to notice the background concepts behind



F Venet, Related to:*"Communacative Operations"* Acrylic on canvas, ance.

Venet's work extracting nts from scientific text books

By cha demonstrate should present new insights. By this I mean t art utilises science a foreign subject in much the s t. When scientists have applied themse o show the visual order and process that mat reversing the emphasis to numerals and demonstrati their internal order information density it should be possible to allow an aesthetically pleasing of mathematics that has previously not been ex upon demonstrated and visualised.

By prefacing this paper with a quote from John Maeda, o the more innovative contemporary computational artists and teachers, essence of the challenge that is contained within this work central challenge is to show that the visualisation of numerals and sc manipulated to produce a visual result that still reflects the sys inherent beauty to art. An analogy can be drawn to typogr works conne poetry, how the typography affects the way that poem is e derstood.

ked is why is it important to have t face or expression shown ifficult and contentious questi wer as it becomes one of subjectivity. states that "*there is a growing mountain of But there is increased nce that we bogged down t specialisation* Bush on as both a good and answer as technological one. Licklidler also

proposes the use of computers to as human's cesses but notes that the lack of a coherent joint la poses is[16].

While the technology is n ions of Licklidler and Bush to be achieved there is still problem of e blinkering their thoughts to other areas limiting their perception lds, and a part of this work is to break down the langua allow the penetration of the perception divide. Artists alitative medium while science is based in quantities (e ce).

A scient quantising physical action, relationship, process etc then begins to understand leads to a different, and I would argue the most insigh orporeal world. Someone who is trained to do this will at is mathematics applied to the physical world. An art ability and therefore loses an insightful manner or e

scientist t as their training does not teach them to look beyond a purely conceptual of their te ve an innate visual aesthetic appearance

unification to re-occur to progress

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