



A Jagged Orbit



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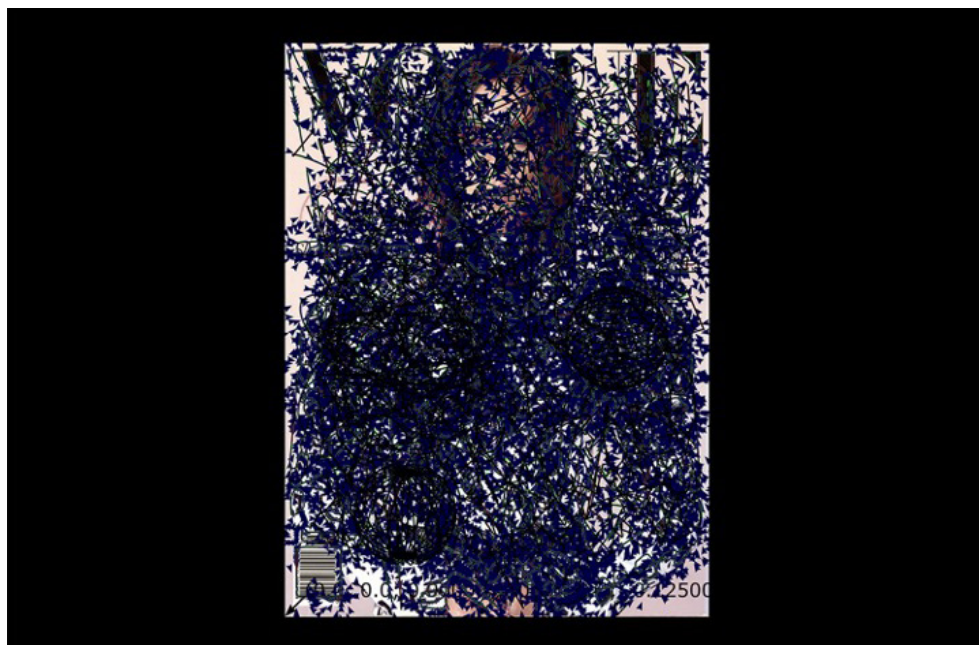
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A Jagged Orbit (2023) is an automated-art-system which algorithmically defaces publications, transforming their physical appearance through gradual cancellation and super-inscription until the original is illegible or unrecognisable. Through multi-input, computer vision path-finding algorithms, the system's mark-making is determined not only by the underlying images and texts of the original publication, but also environmental data collected from where the work is situated, including speech, movement or sound. These additional sources of data (distraction) may cause the system's attention to 'slip' away from its primary task, either inward — toward other, more 'meditative' tasks (representing a kind of mind wandering, or day-dreaming) — or outward, evoking perceptual responses to external stimuli. With the computational power of machines now far exceeding that which is required to execute many of the tasks they are assigned, this artwork speculates on what could happen when an AI becomes bored with, or distracted by, its human counterparts.

Keywords: Automatic Writing, AI & Machine Learning, Post-digital Publishing, Computational Unknowing.

Figure 1: *A Jagged Orbit: Victoria* 2023. [Computer Vision pathfinding simulation process image] Algorithmically corrected readymade of Vogue cover, from *A Jagged Orbit* series, Donnachie & Simionato.



Description

AI systems have proven capable of imitating many human activities. Reading, writing and image-making processes are now reproduced by nonhuman systems (NLP, NLG, Open AI's ChatGPT, GANS, Dall-E, Midjourney, Runway ML, etc.). These AI systems can generate original texts, images, and video that are indiscernible from those created by humans.

Conjecture abounds around the impact of the widespread use of similar systems, often leading to notions that machines will soon replace their human counterparts. At the same time, the computational power of many machines now far exceeds that which is required to execute the tasks they are assigned. In this work, we consider an alternative future/present when machine learning and AI, powered by the exponential growth of computational capacity, will become 'bored' of its automated processes. Through the tedium, we imagine an AI may turn attention away from its original task, its algorithmic functions may 'wander' towards alternate outcomes, discover more pressing or novel pursuits, or simply perform an activity analogous to daydreaming.

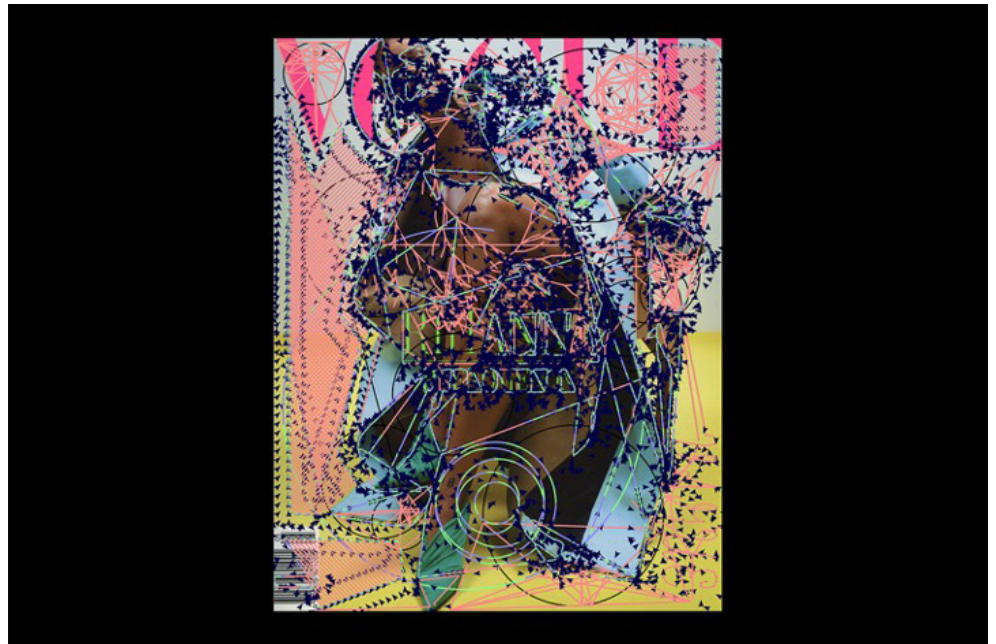
Consonant with notions of the 'wandering mind', the daydream in a robotic system may be accompanied by distracted, repetitive movements. In terms of drawing, or mark-making practices, distracted, unscripted actions may be visually like the human activity of 'doodling'.¹

1. In 19th Century marginalia studies, doodling has been observed as a tool to "record inattention, whimsical digression, critique, and sometimes outright hostility" toward the text that it accompanies (Mercurio and Gabelman 2019).

In human cognition theory, it is believed that “freedom from perceptual input facilitates abstract mental capacities such as creativity, logical analysis, and planning” (Smallwood et al. 2012, 1). This artwork speculates not only on the potential of the AI equivalent to the human ‘daydream’ but also on benefits such a state could hold in the evolution of human-nonhuman collaboration.

Can we give opportunity to the system to waver from its predictable orbits? Can an artificial mind ‘wander’? And if so, how could humans recognise and observe such a ‘wandering AI’?²

Figure 2: *A Jagged Orbit: Rihanna* 2023. [Computer Vision pathfinding simulation process image] from *A Jagged Orbit* series, Donnachie & Simionato.



The Automated Art System

The automated-art-system begins once a book, magazine, catalogue, or other printed matter, is placed within the bounds of its ‘reading area,’ where it is digitised through computer-vision. Some of the primary tasks assigned to this system include calculating Newton’s N-body problem, tracking the artists’ tax receipts, and posting messages to social media.

The system attempts to chain these primary tasks recursively while mark-making across the semantic and aesthetic inputs it identifies on the page. These regions of interest may include figures / faces / objects / type / text / colour fields etc. Simultaneously, sensors in the machine measure data in the physical environment in which it is situated (movement, sound, light, human presence etc).

2. If as Smallwood et al. suggest, that “[mind wandering] is linked to the pursuit of ideas or problems that have, so far, eluded solution” (Smallwood et al. 2012, 1; Smallwood & Schooler 2006), then perhaps our AI agents could be tasked with longer term goals to follow in moments of tedium.

Changes in the environment such as the approach of a human, a sudden sound or spoken conversation, may either ‘distract’ the system from its tasks, or they may ‘jolt’ the machine out of a ‘daydream’ state of apparent inactivity. Interrupting the current drawing routine and raising the ‘focus’ status of the machine will temporarily return it to the primary tasks. Other conditions will increase the potential for further ‘wandering’.

The system is designed to ‘wander’ or ‘drift’ while drawing with marker on the physical publication, both responding to the visual features of the publication & annotating the systems’ primary tasks and calculations. The mark-making is not predetermined, rather the result of blending multi-input weighted path-finding algorithms, generated in real time, with responses to the primary tasks, the environment in which the system is situated and to the (transforming) publication it is drawing over.

Figure 3: Installation view of machine drawing *A Jagged Orbit: Victoria*, 2023. Algorithmically corrected readymade of Vogue cover. Unique edition, unlimited series, Donnachie & Simionato.



Figure 4: Installation view of machine drawing. *A Jagged Orbit: Victoria*, 2023. Algorithmically corrected readymade of Vogue cover. Unique edition, unlimited series, Donnachie & Simionato.



The primary material used in this automated-art-system is existing books and magazines, evoking literary and historic precedents of marginalia, redaction, and other creative/destructive defacing of books within post-digital publishing practices. These publications are ideal for such experimentations as they are readily found and ripe with rhetorically potent text and imagery. Furthermore, the glossy (cast-coated) covers of magazines offer an ideal surface for the machines to draw over, able to accumulate many layers of ink without deforming, and therefore permitting the system to operate autonomously for longer periods.

This research is presented as a response, or provocation, to assumptions of beyond-human computational capacity, and its increasing adoption in building meaning through cultural production.

Acknowledgements. The title of this work is taken from John Brunner's 1969 novel *The Jagged Orbit*.³ In our artwork, the term is useful when imagining the relationship between human and nonhuman agents as if they are two bodies in orbit, the potential for these orbits to decay over time, ending in the event of the collision of both bodies, with the emergence of something new.

The physical outcomes of this work are singular edition artists publications, presented as derivative works (also called, 'corrected ready-mades'). No attempt has been made to contact the publishers, authors, or artists of the original works for permission nor endorsement.

Open-Source Libraries and software used in this artwork: Python, OpenCV, Tesseract, Natural Language Toolkit (NLTK), Vision AI, Google Speech-to-Text, SGPT, Librosa, cnc.js.

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3. Coincidentally, John Brunner wrote the following passage in another short story "Judas": "We've been slaves to our tools since the first caveman made the first knife to help him get his supper. After that there was no going back, and we built till our machines were ten million times more powerful than ourselves" (Brunner 1967).