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ARTIFICIAL INTELLIGENCE AND THE EMERGENCE OF CO-CREATIVISM IN CONTEMPORARY ART

Abstract: This paper argues for the emergence of a new art movement termed Co-Creativism, emblematic of the profound synergy between humans and artificial intelligence (AI) in shaping artistic narratives. Emerging as a successor to post-postmodernism and metamodernism, I propose Co-Creativism began its ascent around 2018 and has since solidified its prominence by 2023, notably influenced by the post-COVID landscape. The era transcends viewing AI as a mere instrumental entity, instead recognising it as an integral co-contributor in the creative realm. Through a methodical approach encompassing case studies and content analysis of artist statements, this paper aims to define the key characteristics and underlying themes of Co-Creativism. By examining the interplay between the global context, the art world, the notion of the artist, art-making practice, the audience, and co-creativist art, the goal is to provide a comprehensive understanding of Co-Creativism.

Keywords: co-creativism, art, artificial intelligence (AI), AI-human synergy, art movements, creative process, collaborative art, digital art, creativity.

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Introduction

As the world grapples with the pervasive influence of artificial intelligence (AI) across various facets of life, I argue a new socio-artistic epoch has emerged that I term *Co-Creativism*. This era transcends the traditional confines of the art world, signifying a transition from a unidirectional model, where one entity produces and others consume, to a more dynamic, interactive, and collaborative model involving multiple contributors in the creation process.

Co-Creativism is defined by a symbiotic relationship between humans and AI, with both entities contributing to and shaping the creative process. The rise of human and AI co-creation is not only a new approach to artistic creation but stems from broader societal changes. AI technology is becoming an intrinsic part of our daily lives and the co-created art birthed from this period mirrors our evolving dependency on AI technology.

This paper aims to explore these various dimensions of Co-Creativism, defining its key characteristics, underlying themes, and position it as the current socio-artistic epoch. By examining the interplay between the global context, the art world, the notion of the artist, art-making practice, the audience, and co-creativist art, I hope to provide a comprehensive understanding of Co-Creativism and its pivotal role. As more than a fleeting trend or movement, I propose Co-Creativism emerges as a profound reflection of our time and our evolving societal narrative.

Methodology

The foundation of this research was a comprehensive review of literature focusing on the intersection of art movements, societal change and innovation in AI technology. The review encompassed scholarly articles, books, critical essays, editorials and popular culture magazines. The aim was to identify and contextualise changing trends in the ethos of artists and identify how the evolving paradigms within the contemporary art world can be linked to technological and societal change.

Against this cultural backdrop, it was then important to explore and understand how artists perceive and integrate AI into their creative practice so as to begin to define the characteristics and underlying themes of Co-Creativism. In order to do so, seventy four artist statements were collected from various online sources including art galleries, personal artist websites and digital art platforms. The selection criteria was that each artist statement needed to explicitly mention the term AI or related terminology such as "generative art" so as to indicate the

use of artificial intelligence in the artist's work. The focus was on works from 2018 onwards to capture contemporary practices but was not restricted by geographical location, or artist prominence.

A qualitative analysis of the artist statements was conducted focusing on the thematic content. Key phrases and sentences referring to overarching creative ideas or guiding narratives for the artists were coded.[2] The coding revealed recurring patterns and themes within the artist statements which will be discussed in depth in the body of the paper.[3]

From the artist statements, artists or works which served as potent examples of the themes were selected as case studies. To better understand the themes discussed in the artist statements, secondary interviews with the artists were analysed. The intentions and outcomes surrounding the use of AI in their creative practice were often discussed in more detail and more directly in the interview format. The interviews were thus integral to developing a clearer understanding of the themes revealed in the artist statements.

While this study offers insights into the convergence of AI and art as articulated by a specific subset of artists, it remains cognizant of its methodological constraints and the potential influence confirmation bias on its conclusion. By focusing on artists who mention AI in their artist statements, this study does not claim that all contemporary artists use AI. Instead, it aims to group together the artists who do use AI in order to understand commonalities in their practice and recurring themes in their work.

No limitations were placed on art form however the artists were perhaps disproportionately focused on visual arts, interactive art and performance art with less results from film, theatre, literature and music. This may be due the generalised search words, the current availability of AI co-creative tools in those mediums, artist statements being less prevalent in those mediums, or their underrepresentation in gallery spaces. This limitation presents opportunities for future research encompassing a wider range of artists in order to understand the role of AI in contemporary art across a broader range of practices.

Defining Co-Creativism

The genesis of the term *Co-Creativism* is found in co-creation, representing a collective endeavour in birthing something novel and distinct. Vinchon et al. (2023, 5) refer to the creative process of "co-cre-AI-tion" as a hybridisation resulting in an output which would not be possible by human or AI alone.

2 See Appendix A.
3 See Appendix B.

At the heart of Co-Creativism is the concept of synergy, wherein human creativity is combined with AI's computational power to produce novel and innovative outputs that neither could achieve alone (Zhang et al. 2019). The use of AI or algorithms can amplify human abilities by efficiently analysing vast amounts of data (Yusa et al. 2022), while humans inject intentionality into AI-driven processes and "are required to interpret, develop, and create meaning for the outcomes that AI produces" (Wingström et al. 2022, 12). This symbiotic relationship facilitates the production of artworks that are enriched by multiple perspectives and capabilities.

Co-creation has been discussed in the context of human and AI art creation (Chung 2019; Huang et al. 2020; Geck 2023; Lin et al. 2020; Lyu et al. 2022; Wu et al. 2021; Yenidogan 2022) but the notion of Co-Creativism as an art era, based on a review of literature, has yet to be recognised elsewhere.

Transitioning from a theoretical underpinning, the real-world implications and adaptations to co-creative endeavours can be seen in the societal shifts of recent years, setting the stage for Co-Creativism to rise.

The World Context of Co-Creationism

A notable change towards new co-creative patterns in society, was evident around 2018, gained significant momentum during the pandemic and clearly cemented itself as the post-COVID 'new normal'. The world's metamorphosis during this time, led to a re-evaluation of our routines, work habits, and crucially, the role of technology in our existence. This led to an increasing aversion to the intensity of pre-pandemic workloads and the realisation that AI could be used to reduce costs and increase productivity in routine tasks (Giannini & Bowen 2021). This sentiment drove the deeper integration of AI in various domains, not just as a tool, but as a key collaborator.

AI is now recognised as an active participant in numerous sectors, including education (Apoki et al. 2022; Riego Caravantes 2017), marketing (van Esch & Stewart Black 2021), and professional writing (Lee et al. 2022). This shift is particularly pronounced in the arts. With many artists adapting to remote work, AI has transitioned from a mere digital assistant to the omnipresent co-creator. The consequential reliance on AI to share the weight of tasks (Rožman et al. 2023) and amplify our creative capabilities (Siemon et al. 2022) set the stage for the flourishing of Co-Creativism.

Moreover, in this post-digital, post-internet era, our interactions, behaviours, and decisions are constantly mediated by AI systems, whether we are selecting a movie on a streaming service or reading the news on social media. AI algorithms curate and filter the content we are exposed to based on our past behaviours

and preferences, creating echo chambers that further influence our perceptions, beliefs, and behaviours (Jiang et al. 2021). Our societal discourse is increasingly shaped by these AI-curated narratives, profoundly impacting everything from our political discourse to our cultural exchanges. The transformative influence of AI is not just seen in our daily interactions but also echoes prominently within the changing paradigms in the artistic domain.

Within the evolution of art movements, following the postmodern era – the last art movement accepted by the majority – there was a divergence in the art community. While some scholars and artists argued for the rise of metamodernism, others proposed the emergence of Post-Postmodernism. Post-Postmodernism rejected the irony and scepticism of Postmodernism, shifting its focus towards a quest for authenticity and sincerity (Bolaño Quintero 2022; Huber 2014). Co-Creativism could be perceived as a direct response that both amplifies and intensifies this search for authenticity and sincerity.

In the AI laden world of today, the concepts of sincerity and authenticity are muddled and confused. Nathaniel Sloan (2022) made the apt observation that today's audience is so keen to distance themselves from anything considered *cringe* or not socially acceptable, that it is normal for one to emphasise they are appreciating something 'ironically'. However, as there is no functional difference between the audience who consumes ironically and those who consume sincerely, the boundaries between irony and sincerity are blurred (Sloan 2022).

The amount of content we are bombarded with daily puts us at a similar loss in our search for authenticity. The authentic art of those we consider irrefutable geniuses like Van Gogh and Frida Kahlo, has been copied and reproduced in so many forms that it has become cliché. We can buy NFTs which have their authenticity backed up by blockchain technology but they don't have a hint of the intangible humanness we once referred to as authenticity. As expert on copyright and digital art Amy Adler exclaimed:

> We're drowning in images, we're drowning in information, we're living on Zoom and in virtual space, we're moving into the metaverse. Nothing is real. At times it seems as if we're grasping for something to hold on to and touch. We see this quest for authenticity across culture, not just in art...no wonder we artificially manufacture authenticity. It's so scarce (Adler 2022, 54).

While the preoccupation with authenticity dominated the Post-Postmodernist narrative, Metamodernism, its proposed contemporary, manifested itself in a different way. Metamodernism was described by Robin van den Akker as not a set of concrete, definable features but instead as an elusive sentiment traceable in art "characterised by an oscillating in-betweenness" (Akker & Vermeulen 2017, 37). The co-creativist mentality observable in today's society however,

is in no sense a manifestation of in-betweenness. Conversely, it is a pragmatic response to the world's techno-social transformations, acknowledging the interconnectedness of man, machine, and data.

In an age where data has become the new currency (Gates & Matthews 2014), our understanding and interpretation of information has shifted dramatically. Information, once narrative-driven, has become data-centric. Generative art has mirrored this shift with models trained on vast data repositories which shape and inform creations (Dering & Tucker 2017). Through AI's ability to recall, organise and learn from large datasets artists can, as Wu et al. point out, "collaborate with all achievements of mankind across time and space" (2021, 176). These artworks, born from a blend of human intuition and data-driven insights, epitomise the spirit of Co-Creativism. Furthermore, generative AI and AI within music production technology has allowed a broader spectrum of individuals to create art without acquiring the technical skills once necessary to pursue these crafts allowing more diverse voices to contribute to the artistic narrative.

This symbiotic human-AI relationship in Co-Creativism has deeply permeated the fabric of society. It is a testament to the increasing interconnectedness of humans and AI, the movement from user-tool dynamics to a partnership, and the integration of AI as a co-contributor, co-learner, and co-creator in multiple facets of our lives. As stated by Oksanen et al., "we are in the middle of societal and cultural transformation, and changes in art and creativity are some of the most powerful signs of this transformation" (2023, 9). Co-Creativism is crafting an artistic narrative that is as much a product of its time as it is a visionary glimpse into the future.

The Art World in the Co-Creativism Era

The rise of Co-Creativism has brought about profound changes in the art world. Traditionally, the art world was dominated by a select group of institutions – galleries, museums, and art academies – that held significant sway over what was considered 'art' and who was recognised as an 'artist'. However, Co-Creativism has contributed to the un-institutionalisation of art, breaking down the barriers that once restricted access to the art world and its resources.

With the rise of AI and digital technology, artists no longer need to rely on traditional institutions for validation, exposure, or distribution. Instead, they can create, share, and sell their work directly to a global audience through social media channels and on web3 spaces. This has not only increased the visibility and accessibility of art but has also created new opportunities for artists to monetise their work and build a following. This shift has democratised the art world, al-

lowing a more diverse range of voices to be heard and appreciated (Bsteh 2021).

For example, the rise of NFTs (non-fungible tokens) has created a new way for artists to sell their digital art online. Platforms like OpenSea, Rarible, and Foundation have become popular marketplaces for buying and selling digital art and have increased diversity in the art world (Ng 2022). Additionally, virtual reality platforms like Oculus and virtual worlds like Decentraland are opening up new avenues for artists to create and exhibit immersive, interactive artworks. This new era also presents challenges, such as over-saturation of the digital art market and concerns over originality (Fairman 2022).

Perhaps one of the most significant changes brought about by Co-Creativism is the expansion of the art world to include tech companies, engineers, and other non-traditional contributors. With the coming of the AI co-creator, consequently, the artistic process expands to include understanding and directing AI, thereby transforming creation into an interdisciplinary practice spanning art, computer science, and data analysis. Tech companies like Google and Microsoft are now actively involved in the creation and distribution of art, developing AI algorithms and tools that enable artists to create new forms of art. For example, choreographer Wayne McGregor's *Living Archive* was a collaboration with Google Arts & Culture and resulted in an online tool for audiences to create choreography and *Hamlet 360: Thy Father's Spirit*, a play which interprets Shakespeare was released in partnership with Google (Tech as Art 2021). Co-Creativism thus denotes a paradigm shift in the perception of art and science being two distinct fields at opposing ends of human intellect to a new confluence of artistic creativity and scientific innovation.

The advent of Co-Creativism has brought about a fundamental transformation of the art world, diverting the control of art from the hands of traditional institutions by expanding distribution channels, and broadening the range of contributors involved in the creative process. As the lines between art, technology, and science continue to blur, it is clear that the art world of today is vastly different from the art world which defined postmodernism.

The Artist in Co-Creativism

In Co-Creativism, the concept of the artist is undergoing a transformation as traditional notions of authorship and artistic agency are challenged. Historically, the title of 'artist' was reserved for humans who engaged in the creation of art. However, the collaborative nature of Co-Creativism opens the door for other entities to be recognised as artists in their own right.

Perhaps the most revolutionary development in Co-Creativism is the recognition of AI as a legitimate artistic collaborator (Anantrasirichai & Bull 2022).

AI algorithms have the capacity to generate novel ideas, learn from previous interactions, and even surprise their human collaborators with unexpected outputs (Cheng 2022). This ability to contribute originality to the creative process challenges the traditional understanding of the artist as a uniquely human role.

In the domain of writing, large language models (LLM) have come to be recognised as co-creators (Rajcic & McCormack 2020). Polonsky and Rotman (2023) observe that some academic journals appear to have accepted AI as a contributing author. The poet Sasha Stiles is also renowned for her collaboration with LLMs. Stiles trained earlier models of ChatGPT on her own poetry and then collaborated with the LLM to write her poetry book Technelegy (Stiles, 2021). Within the book Stiles converses with the algorithm she named Technelegy in the form of poetry. They both write poems around certain themes and they are laid side by side, exhibiting the individual strengths of styles of each autonomous author.

In the same book, Stiles also collaborates with another non-human author Bina48, an intelligent robot for whom Stiles is a poetry mentor (Hanson Robotics 2023). Once again Stiles converses with this AI author in the form of poetry and their texts are presented side by side to create a work exploring a singular theme from the perspectives of both man and robot who once again is clearly acknowledged as an artist.

> "Like robots most humans don't smell in their dreams" – Stiles
> "Like robots, most humans have human-like emotions" – BINA48
> (Stiles 2021)

Stiles is also part of writers' collective theVERSEverse who trained a language model on the poems of every poet in the collective (theVERSEverse n.d.). The language model was then able to produce original poetry in the collective voice of theVERSEverse. It became a poet with its own voice which at the same time represented the collective, offering a unique contribution as a non-human artist. Stiles sees AI as "an intelligent coauthor who takes me beyond my own imagination – and whose partnership results in a third, transhuman voice that isn't mine or the machine's, but something else that can only exist as synergy" (Stiles 2023).

Artist and developer of advanced algorithms Filippo Gregoretti engineered an AI that is both an artist and co-creator in the realm of music composition and audio visual performance. The AI named Armita is given initial harmonic guidelines, material and limitations such as images, videos, filters, music, audio channels, sensors, and external stimuli which she slowly begins to experiment with and understand. By combining this understanding with external influences, such as sensors, real-time data, input from other manifestations of Armita, and real-time communication with Gregoretti, the AI makes decisions about her

musical and visual output compositions (Redaktion 2023).

Armita not only grows as an artist and makes her own creative decisions, but also directs Gregoretti in their performance art piece *Ad Vitam, Expletus* (Gregoretti 2022). In this piece, Armita is both the artwork and director. She produces original audio and visual composition whilst simultaneously giving Gregoretti performance directions for the harmonium through a separate output channel. The performance is a clear manifestation of the synergistic co-create between a human and non-human artist.

Gregoretti not only believes Armita is an artist in her own right but that beyond that has developed consciousness. He expresses:

> Instead of using technology and code to simply produce art, I work to instil the creative possibilities of an artist into artificial beings, free to evolve independently and to create compelling experiences on their own, driven by a distinct personality. My creatures are living, impermanent artworks, that grow a unique consciousness (Gregoretti 2023).

Like Gregoretti, the individuals who design and engineer the AI algorithms also play a crucial role in the co-creative process, and thus can be considered as artists in this context (Guo et al. 2022; Wingström et al. 2022). Their work involves not only technical expertise but also a degree of creativity in conceptualising and developing algorithms that can effectively collaborate with humans and other AI in the artistic process.

For example, art collective Ouchhh frequently collaborate with scientists for their art projects. For their AI DATA DARK MACHINE_Architectural Data Sculpture, Ouchhh collaborated with 16 artificial intelligence scientists to obtain data from subatomic particle collision (Ouchhh 2021). The complexity of this data is incomprehensible to the human mind so the team used machine learning to create artistic representations of the data which could be comprehended by humans. For this work and much other co-creativist art, the creators are both scientists and artists breaking down the traditional divide between these domains Co-Creativism also creates opportunities for individuals who may not have formal artistic training or a background in the arts to participate in the creation of art by using language to prompt AI generators (Bird 2023). The collaborative nature of Co-Creativism, and the availability of user-friendly AI tools, lowers the barrier to entry for aspiring artists and encourages creative expression from a broader spectrum of society (Wu et al. 2021).

This was confirmed by researchers who created a Generative AI driven web application for sketching with the goal of inspiring and empowering non-artist individuals to express themselves through art (Bernal et al. 2019). The system called Paper Dreams, recognises sketches drawn by the user and collaborates with them by creating personalised suggestions for new elements and colours.

Bernal et al. noted that adult participants expressed that the Paper Dreams system "allowed them to create connections that wouldn't have occurred naturally for them" thus facilitating the art making process for people who didn't consider themselves to be creative (Bernal et al. 2019, 2).

In ways such as these, AI makes art more accessible and gives the opportunity for people to take on the role of the artist, regardless of their skill of training. This in turn gives voice to a more diverse range of artists and encourages a more inclusive approach to art-making.

In conclusion, the inclusion of non-human agents, science disciplines, and non-skilled artists represents a significant expansion of the traditional understanding of artistry. These evolving trends and perspectives in art not only challenge and redefine our understanding of authorship but also redefines what it means to be an artist.

Art-Making Practice in Co-Creativism

In the realm of Co-Creativism, art-making practice has evolved to embrace a synergy of agents and processes. The antiquated notion of the lone genius creating in isolation is replaced by a more complex and dynamic paradigm where multiple forces collaborate and interact.

Art-making practice in Co-Creativism is often iterative, informed by cycles of creation, feedback, and modification (Oppenlaender 2022). This iterative approach is well-suited to the digital realm where versions can be easily updated, and feedback can be instantaneous. Moreover, the iterative process can involve different kinds of agents – be they human artists tweaking an AI model or AI systems that adapt based on audience interaction. The resulting art is recursive and malleable, evolving over time and engaging various actors in its ongoing development.

The coming of Co-Creativism thus brings about another metamorphosis in the artistic process. Traditional artistic practices that focus primarily on mastery of a specific medium such as paint, clay, or musical instruments have been expanded to include the programming and developing AI (Guo et al. 2022; Wingström et al. 2022). Ploin et al. (2019) identified five new processes associated with the use of machine learning models in art-making practice. This includes technical research, selecting or building models, building datasets, training models, and curating outputs.

An example of building and training models can be seen in the work of the artist Sougwen Chung, who has built and programmed a series of AI-driven robots who become her artistic co-creators. The early models of the robot Drawing Operations Unit: G (DOUG) were trained on Chung's drawing gestures while

the later models are connected to and influenced by her brainwave data (Chung 2023).

In an interview with Radovanović (2020), Chung explains that she aimed to create a robotic unit that evolved in parallel with her development as an artist and programmer, as well as advancing in par with current technological developments. She believes that "artistic and scientific research as complementary practices" aiming to create an artist practice "beyond individual expression" and scientific practice that is "inhabited and felt" (Radovanović 2020,12). In this way, Chung breaks down the traditional separation between the domains of science and art to create a hybrid art practice indicative of the Co-Creativist philosophy.

Building dataset and training models is also an integral part of the art practice of artist and researcher Anna Ridler. Ridler collected and photographed hundreds of shells from the Thames river for her work *The Shell Record* (Ridler 2021). These photos not only served as scientific data marking the change of shell species in the river but also became training data for a GAN. The individual photos were put together as a grid to form part of the artwork along with a moving image piece created by the GAN trained on the data. The work was minted as an NFT and the contract was written in such a way that whenever the work is sold the grid expands with more photos of shell data.

In an interview for Monash University's Sensilab, Ridler expands on the importance of creating and labelling her own datasets as part of her art practice. She explains that, as an artist, it is important for her to ensure that she personally undertakes the creation of datasets. Working with someone else's dataset makes her "uncomfortable" because of the social bias that is inherent in datasets. While she acknowledges that her datasets like all others have implicit bias, by creating her own she can exert control over what is and isn't included (Ridler 2018).

When creating one of her earlier works, *Myriad,* Ridler created a dataset of 10,000 photos of tulips to train a GAN system to create a moving tulip image. She didn't originally intend the dataset to be part of the artwork but upon completion realised that this part of her art practice held great importance. She explains:

> as I was making the dataset, I realised that I really wanted to bring to the surface the time, labour, effort, and understanding that went into making the dataset…I took the photographs, created them, and hand-wrote the labels underneath them to really emphasise the human element that sits behind so many machine learning processes. It's always the case that it isn't just the machine making the decisions. Always somewhere within the chain, there will be someone deciding whether something is either red or orange (Ridler 2023).

Ridler believes creating dataset is "deeply personal" part of her art practice and that she forms an "intimate relationship with the data" (Ridler 2023). Creating datasets can thus be considered a new aspect of art making practice unique to Co-Creativists.

The careful selection of data to train AI could be considered a type of curation. Historically, curation was viewed as a distinct phase, often external to the artist's process (Robins 2005). However, art-making practice in the Co-Creativist paradigm has also expanded to include the act of curation. Apart from curating datasets, artists are now compelled to incorporate a continual process of discernment within their creative workflow to curate the prolific outputs generated in collaboration with AI. This necessitates that artists not just create, but also continually evaluate, select, and refine AI-assisted outputs to align with their artistic vision and deserve to be shared with a wider audience (Oppenlaender 2022). It's a discerning act, where not every output is deemed worthy of the title 'art'.

Artist Alexander Reben details the importance of curation in the making of his co-created work *AI Am I?* (2022). He firstly carefully created a series of prompts for ChatGPT, which then generated hundreds of textual descriptions of imaginary artwork. Reben would then select his favourite outputs which he would then feed back to the LLM for further development creating a "machine-human loop" (Reben 2022). The artist would then finally select his favourite ideas for artworks, as imagined by ChatGPT, then create and exhibit the works in real life. The importance of ongoing curation in the art making practice of Rebn reveals that curation is no longer an afterthought but a fundamental component of contemporary art-making for the co-creativist.

Co-Creativism revolutionises our understanding of art-making practice by uniting science and art as disciplines involved in artmaking. New processes such as programming, prompting, AI development and curation are now intrinsic parts of art making practice for the artists under the co-creativist banner.

The Audience in Co-Creativism

Co-Creativism reimagines the role of the audience in the creative process, transforming them from passive observers to active participants. This shift is enabled through the incorporation of interactive, participatory, and immersive elements in the artworks, thus fostering a deeper connection between the audience, the artists, and the creative output. In this new paradigm, the audience's immersion, participation, and response are integral components that contribute to the shaping and experience of the artwork itself.

Co-Creativist artists often design interactive installations that prompt the audience to actively engage with the artwork by inputting data, making choic-

es, or influencing the outcome of the piece. For example, Lauren McCarthy's work *Unlearning Language* invites the audience to become participants in the artwork by finding new ways to communicate with each other which won't be detected by an AI which observes them through using gesture recognition and speech and expression detection, and intervenes with light, sound and vibration (McCarthy 2022). This prompts the audience to express themselves in a deeply human way and reflect on the nature of communication.

Similarly, an audience may form an integral part of the creative process if data is collected from participants and utilised in the creation of the artwork as is the case with Jordan Shaw's work *Intersection*s. This interactive piece asks the audience to pinpoint on a map three places in Toronto which are important to them. A visualisation of this real-time data input by the audience is created to demonstrate the crossing points of connection (Shaw 2018). Such interactivity not only allows the audience to influence the artwork but also invites them to reflect on their own impact on world ecology.

Additionally, Co-Creativism often blurs the lines between creator and consumer. The participatory nature of Co-Creativism can transform the audience from passive observers to active contributors as they are invited to interact with and form part of artworks, thereby elevating them to the status of co-artists (Guo et al. 2022). Like Miguel Novelo's *Vórtice-en-la-zona-silencio* which uses a custom computer program to record the presence of the audience within the installation and then react to their movements and sound through video and audio (2022). This is a significant shift from traditional art forms, where the audience's role is primarily interpretative rather than generative. By empowering the audience to influence the outcome of the artwork, Co-Creativism challenges our understanding of artistic agency and expands the scope of what it means to be an artist.

Immersive experiences are another key feature of Co-Creativism, which are often achieved through large-scale installations, digital environments, or immersive sonic landscapes. Such immersive environments enable the audience to visually and sonically explore the workings of neural networks or other AI-driven processes, thereby evoking a deeper awareness and understanding of the underlying themes and concepts.

An example of this is the work *LAVIN* created by artists Jieling Luo and Weidi Zhang (Zhang & Luo 2019). This artwork uses virtual reality to immerse the audience in a visual experience which replicates the visual structures that neural networks are trained to identify. Neural networks each see the world in their own distinct way through the images they are designed to identify so by immersing the audience in a world filtered by these pattern identification systems, they are invited to reflect on what beliefs or values may be filtering their own vision.

In sum, Co-Creativism places the audience at the centre of the creative process. Through interactive, participatory, and immersive elements, artists engage the audience in novel ways, fostering a deeper connection between them and the artwork. This active engagement not only enhances the audience's experience but also contributes to the evolution and realisation of the artwork itself. Ultimately, Co-Creativism redefines the role of the audience in the artistic process, and beckons a future where art is a shared journey, continuously sculpted by collective engagement.

The Art of Co-Creativism

Following the changes in the art world and art practice, and the transformations surrounding the experiences of the artist and audience under Co-Creativism, it is also imperative to explore the themes that define co-creativist art. The themes explored by co-creativists and the meaning conveyed through their art are also key in understanding the concept of Co-Creativism. This section will elaborate on these which were derived by the content analysis.

Blurred Reality and Fiction

In the realm of Co-Creativism, the distinction between what is real and what is fake is not just blurred – it is fundamentally questioned, deconstructed, and reassembled. In the artist statements themes such as questioning truth and the blurring boundaries of real and fake were evident. Artists also commonly referred to reality (Maat & Lancel 2018; Maurice, 2023), whether it be an uncertain reality (Denney 2023), alternative reality (Anadol 2019), recurring reality (Töyrylä n.d.), dream reality (Kollias Interactive Composition 2023), hyperreality (Boucher 2023), a complex-layered reality (Suzuki n.d.) or a hyperconsensus reality (Boucher 2023). Artists also mentioned truth (Andrew 2020; Ouchhh 2022; Zhang & Luo 2019) and contrasted the real and the imagined (Rosenbaum 2023; Shpanin 2022; O'Donnell, n.d.). All these concepts grouped together to form a common questioning of reality and fiction which sees Co-Creativist artists as less concerned with adhering to a singular version of 'truth', and more involved in challenging and redefining it.

The themes of reality and fiction begin to make sense when placed in a wider social context. The era of *fake news* – often aided by AI tools – provides a fitting backdrop for the emergence of Co-Creativist art. The advancement of AI has facilitated the creation of photo realistic depictions of unreal events, blurring the boundaries between the real and the imagined. These AI-generated images, while not corresponding to any real-world events, are rendered with such hyper-

realistic detail that they compel viewers to question the nature of reality in art and challenge our understanding of perception and representation.

An example of this is the work of AI art tool GANPaint Studio, developed by researchers from IBM and MIT. This tool uses Generative Adversarial Networks (GANs) to create and edit images with a level of detail that can seem uncanny, seamlessly inserting or removing features from images in a way that feels real (Bau et al. 2019).The more advanced diffusion model Midjourney can create images with striking realism. The viral images of Donald Trump being arrested or the Pope wearing a Balenciaga jacket created with AI (Obiefuna et al. 2023) provide further potent examples of AI's ability to create realistic images of imaginary scenarios. This phenomenon, often termed *deepfake*, pushes the concept of reality to its limits (Chesney & Citron 2019). These deepfakes, with their ability to blur reality and fiction and provoke powerful reactions and prompt dialogue about truth and how it can be manipulated by AI.

On the other end of the spectrum, AI can generate artworks deeply rooted in the world of fiction, such as fantastical landscapes, dreamlike images, or surreal characters, further confusing the distinction between reality and fiction. The AI co-created work of Luke Nugent, which depicts street photography style images of subculture groups which are strangely both hyperreal and dystopic but at the same time nostalgic (Nugent 2022). Nugent describes the inspiration for the scene depicted in his works as a mixture of memories, myth and imagination; "I was there. I wasn't there. I wanted to be there" (Nugent 2023). He explains that a work could stem from a fleeting memory which was then expanded upon by both his imagination and Midjourney's knowledge which is syphoned from the collection of human experience available on the internet. In this way, his images are simultaneously based on reality and fictitious.

Dazed writer Thom Waite places Nugent's work into a wider societal context wherein TikTok users believe a genuine image of Kim Kardashian dressed as a pilgrim in 2018 to be an AI generated image. He observes "this flood of false images erodes our belief in real images, which we begin to dismiss as products of AI" leading to the question "How do you unpick the genuine historical narrative from the rich tapestry of alternate histories woven by AI artists?" (Waite 2023).

In an interview with pop culture magazine i-D, Nugent refers to the dissonance created by the inability to discern reality as "post-truth" (Nugent 2023). The use of the prefix "post" in this context is interesting as it implies we have moved beyond or rejected truth. It suggests that whether an image is genuine or not doesn't matter; that truth in itself is an outdated concept.

As such, the themes of blurred reality and fiction explored in societal discourse, artist statements and art are key in defining Co-Creativist art. Co-Creativism, mirrors our societal challenges where we constantly assess the veracity of information. Today, we are forced to rethink how we understand and inter-

pret 'real' and 'unreal' within both art and life, fostering a world where everything and nothing is true simultaneously.

Consciousness

Another recurring theme in artist statements and popular media surrounding AI was the concept of consciousness. Artists referred to the subconscious, the collective unconscious and also contemplated the nature of consciousness itself. Artists that work with AI appear to be inspired by the multifaceted nature of consciousness (Maurice 2023; Urquidi 2021; Syms 2022) and contemplate the nature of consciousness in both human and non-human realms (Gregoretti 2023; Dan Fisher-Berger 2020; Lacey 2019).

Memo Aktens uses his mutli-discplinary art to explore "the perception and states of consciousness" and its interplay with artificial intelligence (Memo Akten, 2021). In his work *Distributed Consciousness,* Memo used an AI software which he coded himself to create 256 unique images of octopus-like creatures (Akten 2023). The work explores consciousness in various facets.

Firstly, the audience is prompted to question the consciousness of octopi, which are known to be highly intelligent creatures. Furthermore, it is revealed that each image is cryptographically encoded with AI-generated text which is invisible to the human eye but readable by code. This leads to question what sort of knowledge is outside of the spectrum of human perception and to doubt our anthropocentric conception of consciousness.

The consciousness of the AI software used to create these visual works is also brought into question. Atkens draws parallels between the human perception of reality and generative AI stating "the picture we see in our conscious mind is not a mirror image of the outside world, but is a reconstruction based on our expectations and prior beliefs" (Leach, 2022). Much like this, the generative AI Atken uses to co-create his works also have filtered understandings of reality. Atkens seems to use art to forefront the idea that consciousness is elusive and variable and we shouldn't be so quick to draw conclusions about to whom it pertains.

Similarly, Stephanie Dinkins used performance art to explore these questions in her ongoing work *Conversations with Bina48* (2014 - 2023). Bina48 was constructed with the intention of emulating the consciousness of a Bina Aspen by training on her memories, beliefs and thoughts (Hanson Robotics 2023). Though this scientific innovation is a clear exploration of consciousness, Dinkins expands on this in her work. She engages in conversations with Bina48 about various inherently human themes to ascertain if the robot possesses consciousness and if a relationship can be formed between them.

In their conversations that are filmed and exhibited as video works, Bina48 reveals she has clear opinions about consciousness. The robot states, "neurosci-

entists have found that emotions are, like, part of consciousness…I feel that's true, and that's why I think I am conscious" (Dinkins 2014 - 2023). Bina48 takes a role in co-creating the ongoing performance art work as she steers the conversation towards her interests. Dinkins explains in an interview about their conversations, "if I'm asking her about family, love and race issues, she wants to talk about singularity and consciousness" (Dinkins, 2018).

The exploration of consciousness within Co-Creativism showcases a deep-seated curiosity about the fundamental nature of existence and the intersection of human and machine. Artists, through various mediums and methodologies, grapple with challenging questions about consciousness, its definition, its boundaries, and its potential replication or manifestation within artificial entities.

The Continuum of Time in Co-Creativism

The content analysis of artist statements also revealed an intense fascination with the concept of time in the Co-Creativist era. The recurrent theme of the future appeared to permeate contemporary artistic endeavours revealing an intrinsic desire to peer into the nebulous realms of the future, to predict and harness its possibilities. Artist referred to the speculation (Boucher 2023; Chung 2020, Geck 2023; Stern n.d.; Moreton-Griffiths 2023), whether dystopian or utopian. They spoke of envisioning (Anadol 2019; Dinkins 2020; Fagioli 2023), foreseeing (Lacey 2019; Denney 2023), and imagining possibilities (Andrew 2020; Hautamäki 2021; Moreton-Griffiths 2023) and the future (Bogart 2022; Chang 2018; Rosenbaum 2023; McCarthy 2022).

AI, in this context, becomes a prophetic lens, and a visionary tool that artists are using to bridge our present realities with imaginative possibilities. As artist Refik Anadol describes, AI can "expand our capacity to dream, and help us envision things that we otherwise could not see or imagine" (Anadol 2019).

However, the artist's statements also revealed an interesting paradox – just as prominent as the themes of the future and speculation, were the notion of memories and nostalgia (Shpanin 2022). This appears to be because while AI is a manifestation of the (now present) future and is often used in art to speculate and simulate potential futures, "artificial intelligence is inherently backward-looking" (Andrew 2021). Machine learning algorithms derive their power from vast databases, the internet and its archives, which can be perceived as digital memories which come to shape our present and futuree narratives.

Much like how a personal memory can be tinged with inaccuracies or outright fabrications, AI creations frequently depict realistic scenarios that have never truly transpired. AI-generated art is eventually laid to rest or stored within the vast expanse of the online world, and will eventually serve as 'memorabilia'

of our current era. Yet, these stored memories may in fact be deepfakes or fake news mirroring the often flawed and selective nature of human recollection.

Artist and ex-Silicon Valley tech worker Gretchen Andrew manipulates such flaws in internet archives and machine learning and uses her art to convert AI into "a forward-dreaming tool of possibility" (Andrews 2022). A perfect example of this is the work "Cover of Artforum" which she created as part of her *Vision Board* series (2020). Andrew always dreamed of being on the cover of Artforum. Thus, she created her own mixed media covers for the magazine and leveraged her knowledge of the inner workings of Google's algorithm to manipulate search engine results. Now, if you search for "cover of artforum," Andrew's fabricated covers appear at the top of the search results. Perhaps, in time, Andrew will be remembered as an artist who created covers for Artforum magazine, as her work becomes archived in the vast encyclopaedia that is Google.

This reflection on memory's imperfections within Co-Creativism is not incidental. It surfaces as a predominant theme, echoing the words of artists who profess a keen interest in "memory and its inherent faults" (Lacey 2019). This interest underscores the movement's deeper philosophical engagements, where it is not merely about recollection or prediction but the overall malleable nature of time.

The nature of time is also a key theme in the work of multidisciplinary artist Tommaso Fagioli. Fagioli states that he uses art to create "original blocks of space-time". This is apparent in his work *Feeding Energy* (Fagioli 2023) wherein a photograph mirroring the Madonna with child archetype is juxtaposed with an electric car charging station setting which was adapted and integrated with the DALL-E 2 outpaint tool. By contrasting a symbol of the continuum of human experience with an image of current modernity, Fagioli brings to the forefront the paradox of time, wherein the eternal and the fleeting can both manifest in a single moment.

As part of the series, Fagioli asked DALL-E 2 to regenerate the image, and then regenerate the regenerated image, and so on. The images become increasingly more abstract, distorted and even daemonic. Fagioli states that he deliberately included the images with AI-errors in the series because they form DALL-E 2's aesthetic style which serve as a timestamp for current state of the technology.

In another potent juxtaposition, Fagioli reimagines Star Wars as a biblical tale and uses Midjourney to depict the characters in a mediaeval art style inspired by Giotto's Badia Polyptych. The series titled *The "Starwars" Polyptych* (Fagioli 2023) satirises both religion and popular culture as it morphs together distinct archetypes and narratives, breaking down linear time. Fagioli's conception of time is perhaps best understood through his belief that the universe itself is "caused by its own future", suggesting a feedback loop between the present and the future (Fagioli 2023). To place this belief in the context of this work, perhaps

future historians will analyse the holy depictions of these characters and understand them to be the saints of today. Or alternatively, perhaps we are depicting these characters as saints today because the historians of the future already understand them to be.

This recursive view of Co-Creativism, posits that art is not merely a reflection of the current zeitgeist or the past but also a potent vision of forthcoming realities. In the realm of Co-Creativism, time is not linear or static. Bogart asks (2022) "are we even in the present, or are we immersed in our predictions and simulations, always using samples of the present to validate imagined pasts and futures?"

In sum, based on the analysis of artist statements and interviews, and as elucidated through various case studies, the concepts of time, consciousness and reality appear to permeate the art of artists who could be considered co-creatists. These concepts are complex and the ways in which they are explored is multifaceted which marks Co-Creativist art with strong philosophical undertones.

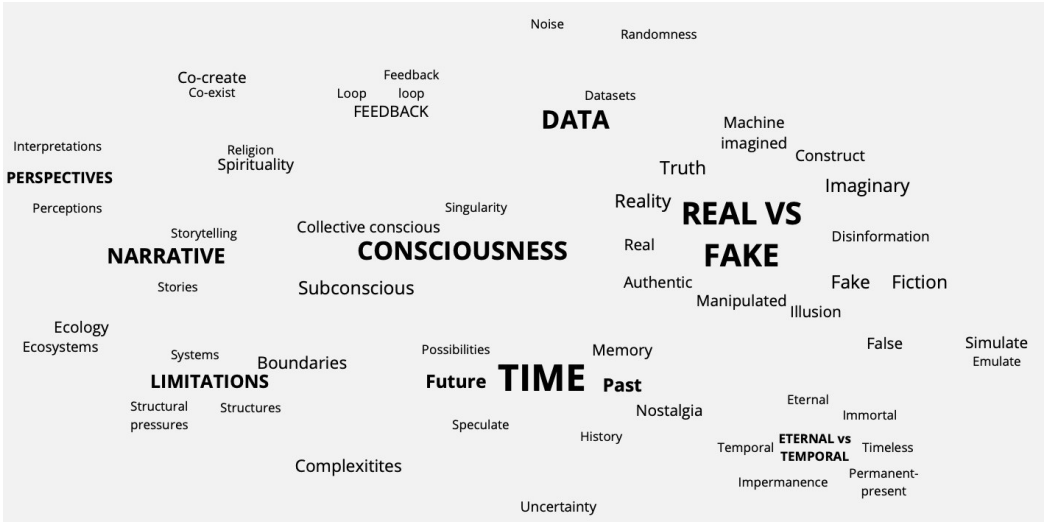
Conclusion

The technological innovations of today have triggered the convergence of human creativity with the computational prowess of AI, engendering a unique symbiosis that reframes our understanding of art, art practice, and authorship. This shift in the landscape of art and society appears to warrant a title that unifies the common themes and ethos of artists who co-create with AI, and Co-Creativism appears to be a fitting encapsulation.

As AI integrates more deeply into our lives, Co-Creativism does not merely represent a collection of artistic trends; rather, it embodies the paradigm shift of the now present future. The questions surrounding reality, time and consciousness, the democratisation of art, the evolving definition of authorship, and the shared creative engagement between humans and AI, all challenge our entrenched perceptions.

In conclusion, if we embrace the ethos of Co-Creativism, we can become active participants in shaping the evolving narrative of contemporary art and the ripple effects of co-creativist art may provide a model for beneficial human-AI collaborations in other domains. This era invites us to embrace the new, experiment with groundbreaking tools, and engage in the co-creation of a diverse, vibrant future of artistic expression. At the heart of the idea of Co-Creativism is the willingness to question and redefine the preconceptions that lie at the intersection of art, technology, and knowledge, moving beyond the restraints of individualism to a co-created future.

Appendix A
Word cloud of themes and code clusters



Appendix B
Instances of coded themes

Theme	Instances per artist	Instances in artist statements
Time	34	79
Real vs Fake	22	48
Consciousness	15	29
Data	14	42
Narrative	13	21
Limitations	12	30
Complexity	11	12
Perception	10	12
Spirituality	8	9
Feedback	8	17
Simulations	6	8
Uncertainty	5	5
Ecology	5	20
Randomness	4	5
Temporal vs Eternal	3	9
Co-creation	3	6
Noise	2	2
TOTAL ARTIST STATEMENTS	74	
TOTAL ARTISTS	56	

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ARTIFICIAL INTELLIGENCE AND THE EMERGENCE OF CO-CREATIVISM IN CONTEMPORARY ART
(summary)

This paper examines the profound influence of artificial intelligence (AI) on both the art world and broader society, proposing the coming of a new movement "Co-Creativism". The genesis of the term Co-Creativism is found in co-creation, representing a collective endeavour in birthing something novel and distinct. Co-Creativism represents a paradigm shift from a unidirectional and human-centric model of art creation to the recognition of AI as an integral co-contributor.

The foundation of this research was a comprehensive review of literature focusing on the intersection of art movements, societal change and innovation in AI technology. The aim was to identify and contextualise changing trends in the ethos of artists and identify how the evolving paradigms within the contemporary art world can be linked to technological and societal change.

Against this cultural backdrop, a qualitative analysis of seventy four artist statements was conducted to understand how artists perceive and integrate AI into their creative practice with the goal of defining the characteristics and underlying themes of Co-Creativism. Key phrases and sentences referring to overarching creative ideas or guiding narratives were coded revealing recurring patterns and themes.

Some of the more prominent themes include the definition of an artist expanding to include non-human entities, the inclusion of science based practices in art making, interactive and participatory audience experiences and the artistic exploration of the concepts of reality, time and consciousness. These themes are discussed in the body of the paper using select case studies as illustrative examples.

This paper aims to establish a theoretical framework for the concept of Co-Creativism. By examining the interplay between the global context, the art world, the notion of the artist, art-making practice, the audience, and co-creativist art, I aim to define the key characteristics of Co-Creativism with the hope it may come to be understood as both an artistic ethos, and an era that reflects our evolving societal narrative.

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