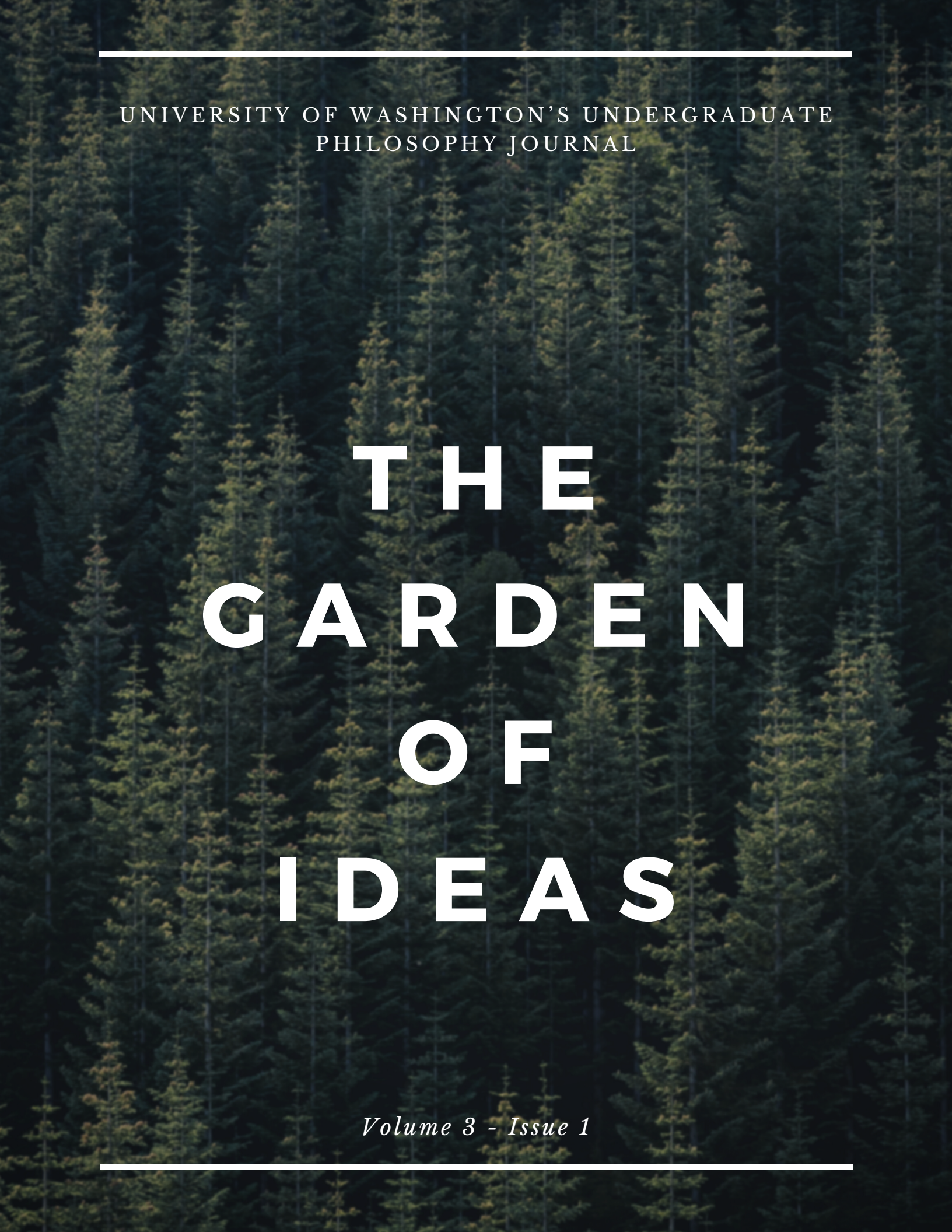

UNIVERSITY OF WASHINGTON'S UNDERGRADUATE PHILOSOPHY JOURNAL

THE GARDEN OF IDEAS

Volume 3 - Issue 1

TABLE OF CONTENTS

Dear Reader,

I am particularly thrilled to present you with this issue of the Garden of Ideas - my first as editor-in-chief. The journal has been weathering a period of change and while there have been growing pains, everything has been in service of putting together the fantastic collection that is now before you. In the coming pages you will find musings on AI ethics, memory and narrative, social norm theory, and other diverse topics.

Please enjoy,

Rhea Shinde
Editor-in-Chief

COMPUTATIONAL PRODUCTION OF SIMULACRA

Andre Ye

A large painting, framed in a rigidly square ornamental bronze frame, hangs at an art auction. It is entitled *Edmond de Belamy*.[1] A blurry figure stares blankly out of its frame at a crowd of eyes, real ones, staring blankly back. The figure's black coat fades into a heavy smoke; its dull white collar melts away into the background. It appears to register the marks of artistic authenticity: the messy brushstroke, the slightly distorted face. In the bottom right corner is the signature of the responsible artist:

$$\min_G \max_D E_x[log\ D(x)] + E_z[log\ (1 - D(G(z))]$$

The painting sells for $432,500.

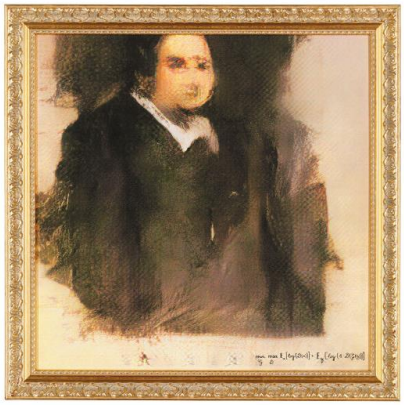

Figure 1. *Edmond de Belamy.*

[1] Obvious Art, Edmond de Belamy, inkjet printed on canvas, 2018, Anonymous, https://obvious-art.com/portfolio/edmond-de-belamy/.

The principal creator of *Edmond de Belamy* is no human, but a Generative Adversarial Network (GAN),[2] an algorithm which garnered excitement in the field of deep learning as a clever method to generate convincing images. GANs are built from two models: a generator G and a discriminator D. The generator is a neural network that accepts a random vector input, call it z, and produces a synthetic image $G(z)$. The discriminator is presented with two forms of data: *real* images sampled from a dataset of real images and *irreal* images synthesized by the generator (recall: $G(z)$). The objective of the discriminator is to distinguish whether any given image is real or irreal. The objective of the generator, on the other hand, is to minimize the discriminator's performance by generating images which are indistinguishable from real images in the dataset. Therefore, the discriminator and the generator play a min-max game which is directly adversarial in nature, such that a success for one player is a failure for the other. Yet, complex evolutions of performance play out in this adversarial relationship through time: as the generator improves, the discriminator must develop novel approaches to separate real and irreal, which in turn prompts further development in the generator. What deep learning researchers want above all is for neither player to consistently dominate over the other, but for both to be in a competitive limbo, locked into a competitive scheme of mutual self-improvement.

Generative Adversarial Networks employ the concepts of the *real* and the *irreal*. It begs us towards perhaps *the* (post)modern philosopher of reality and media, Jean Baudrillard. Baudrillard's classic treatise *Simulacra and Simulation* is an exploration into *simulacra*, or 'copies without originals.' Conventional representations have some attachment to a "real" object; for instance, old photographs of people are not merely dots of ink on paper but representations of "real" people who lived, breathed, and walked somewhere, sometime. But when we attach our sense of meaning more towards representations than to the objects they represent, and build representations of representations and representations of representations of representations, the "real" objects are severed and lost into the void of meaning, and we come to live fully in a world of simulacra. We consume representations and constitute a "real" object for which it represents when the very existence of that "real" object is an illusion.

[2] Goodfellow, Ian J., Jean Pouget-Abadie, Mehdi Mirza, Bing Xu, David Warde-Farley, Sherjil Ozair, Aaron C. Courville and Yoshua Bengio. "Generative Adversarial Nets." NIPS (2014).

I. An Algorithmic Reading of Generative Adversarial Networks

GANs very literally produce copies without originals: these models reproduce images — representations which appear to represent some object in or of reality — of entities which never existed, events which never happened. Deepfakes, artificially synthesized images featuring powerful people in damning positions weaponized to spin political and social scandal, have already been shown to thwart the integrity of experienced reality. In this sense, GANs *are* a technological instantiation of the production of simulacra. They are Baudrillardian nightmares: even more autonomous and proliferable than the Disneylands and *Apocalypse Now*'s which Baudrillard so sharply criticizes.

This, however, is not what I want to explore in this article — there has been a lot of great work done on the dangers of GANs as technological objects. A GAN is more: it is a meaningful analytical framework to understand and enrich the theory of simulacra. A deep generative model is one of few technologies which can convincingly produce literal simulacra.[3] As an algorithm, it allows us to concretely understand the production of simulacra, or at least one mode of production, in the language of mathematics and statistics. GANs, I argue, serve as a model to understand the genesis and evolution of simulacra over time.

Let us begin by more closely understanding the character of the generator. The generator accepts a random input vector z drawn from a probability distribution $p_z(z)$; that is, $z \sim p_z(z)$. The generator learns to transform this input into an image $G(z)$ through a series of statistical operations. Note that the generator must produce different images $G(z)$ for different z. Suppose the generator produced the same image for any input z ($\forall z \sim p_z(z): G(z) = A$, A being some fixed image). Then, to fulfill its objective of distinguishing between real and irreal images, the discriminator needs only to check if the given image is equivalent to A; if it is, then it has been generated, and if it is not, then it has been sampled from the real dataset. But this means that the generator has completely failed its task of minimizing the discriminator's performance. The generator cannot be "lazy" or "uncreative"; this is directly contrary to the adversarial nature of the game. Instead, the generator must generate a real-seeming "world of representations" which are probed by that random, meandering vector z. z performs the critical role of providing the stimulus to produce difference. The generator must produce images which are diverse and varied, which replicate the structure of difference that holds up the real as we experience it. From this reflection emerges a small development we may append to the theory of simulacra: simulacra which are too still and singular cease to be simulacra; they are designated as

[3] There exist other deep generative models (see: stable diffusion), but we focus on the GAN here.

copies and the real which they represented slips out from under, its presence now made obvious.

Despite the daunting creative task it takes on, the generator has no sense of "volition". It is entirely deferential to the discriminator: its every movement is directed towards negating the discriminator's ability to distinguish real from irreal. It is rendered subservient by its commitment to subversion. Initially, the discriminator's task is simple, because the generator has not yet developed the ability to produce convincing, real(istic) images. Thus the discriminator rests easy and acquires a lazy spirit. There is no threat to the real. The generator exploits the discriminator's stupor, and learns quickly: the generator begins producing images for which the discriminator cannot reliably apply the separation of real from irreal. The discriminator's sense of reality is subverted: it marks some real images as irreal, and some irreal images as real. Desperate to sustain the distinction, the discriminator adapts. It comes to understand the generator's behavior, to develop new criterion for what is real and what is irreal. It learns to recognize certain features which it uncritically perceived as real now as hallmarks of the irreal. One may say that the discriminator's sense of reality is now more closely guarded: that, upon provocation, it has built tall barriers around the prized real in place of the previously ungoverned, indeterminate territory. In turn, the generator must adapt and overcome these walls. The generator hacks away at the barriers, leaking the real into the irreal and the irreal into the real. Back and forth, one agent moves against another, battling like two armies in a relentless war.

In an ideal end, after prolonged battle, the generator finally triumphs over the discriminator; the discriminator cannot distinguish real from artificial with any certainty. This is not that same "lazy discriminator" we visited at the beginning, but a wise, battle-hardened discriminator — yet even this discriminator has been overcome. It has fought a long battle, continuously restricting and re-sensitizing the boundaries of the real, until it has inevitably backed itself up onto a precarious cliff with nowhere else to restrict towards. There is nothing left to exclude, to distinguish, to discriminate. The irreal has invaded the real.

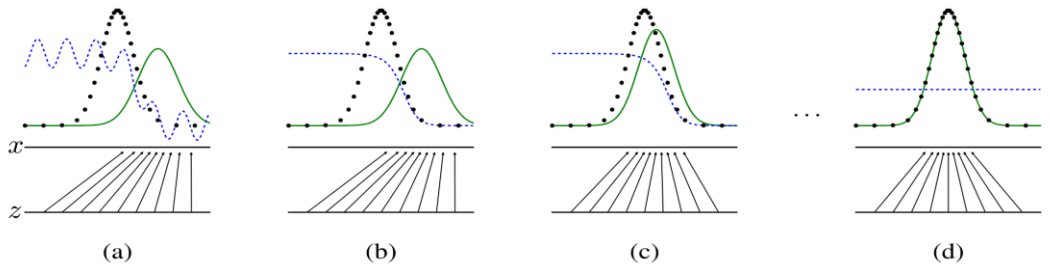

Figure 2. *Figure from Goodfellow 2014. Dotted blue represents the discriminator distribution. Dotted black represents the original data distribution. Solid green represents the generated distribution. Observe that the generator maps the random vector z to some "realistic distribution" in x. a) Initialization of GAN system. b) Discriminator near-perfectly discriminates between real and irreal by "dropping down" for x which the generator is dense in. c) Generator adapts by shifting its distribution closer towards the real distribution, such that the discrimination between generated and real is no longer as accurate. d) The generator perfectly matches the original dataset, and the discriminator can make no meaningful discrimination between generated and real at all (hence a flat line).*

To understand this as a simple triumph of the irreal over the real is to neglect the complexity of the system. The very meaning of the terms "real" and "irreal" is marked, as Saussure tells us in their structuralist linguistics, by their difference. Yet we have, by definition, a collapse of this very difference. It seems, then, that the real and the irreal have lost their substantive meaning. This is a familiar insight: Marx, for instance, does not propose that the proletariat revolt against the bourgeoisie to dominate them, but rather to dissolve *themselves*, insofar as by definition there is no proletariat in a classless world.

But the significance goes deeper. In optimal system convergence, the generator perfectly replicates the distribution of the original dataset. In formal terms, let p_g be the distribution of the generator's outputted images (produced by varying z appropriately and collecting the resulting $G(z)$); and let p_{data} be the distribution of the original "real" dataset. It is proved in the original GAN paper that p_g converges to p_{data}. In philosophical terms, the irreal succeeds in its "invasion" of the real by imitating (simulating) the real so well that it becomes it.

Theorem 1. *The global minimum of the virtual training criterion $C(G)$ is achieved if and only if $p_g = p_{data}$. At that point, $C(G)$ achieves the value $-\log 4$.*

Proof. For $p_g = p_{\text{data}}$, $D^*_G(\boldsymbol{x}) = \frac{1}{2}$, (consider Eq. 2). Hence, by inspecting Eq. 4 at $D^*_G(\boldsymbol{x}) = \frac{1}{2}$, we find $C(G) = \log \frac{1}{2} + \log \frac{1}{2} = -\log 4$. To see that this is the best possible value of $C(G)$, reached only for $p_g = p_{\text{data}}$, observe that

$$\mathbb{E}_{\boldsymbol{x} \sim p_{\text{data}}} [-\log 2] + \mathbb{E}_{\boldsymbol{x} \sim p_g} [-\log 2] = -\log 4$$

and that by subtracting this expression from $C(G) = V(D^*_G, G)$, we obtain:

$$C(G) = -\log(4) + KL\left(p_{\text{data}} \middle\| \frac{p_{\text{data}} + p_g}{2}\right) + KL\left(p_g \middle\| \frac{p_{\text{data}} + p_g}{2}\right) \tag{5}$$

where KL is the Kullback–Leibler divergence. We recognize in the previous expression the Jensen–Shannon divergence between the model's distribution and the data generating process:

$$C(G) = -\log(4) + 2 \cdot JSD\left(p_{\text{data}} \| p_g\right) \tag{6}$$

Since the Jensen–Shannon divergence between two distributions is always non-negative and zero only when they are equal, we have shown that $C^* = -\log(4)$ is the global minimum of $C(G)$ and that the only solution is $p_g = p_{\text{data}}$, i.e., the generative model perfectly replicating the data generating process. □

Figure 3. *Proof from Goodfellow 2014, showing that in optimal conditions, the generator "wins" when it perfectly replicates the distribution of the original dataset.*

But this is an ideal end, and ideal ends are often incongruent with experienced conditions. In practice, GANs often experience "generator collapse", in which the discriminator's ability to distinguish real from irreal is so staunch and irreconcilable that the generator stalls in its own incompetence. It is simply too difficult to scale the walls of the real which the discriminator has constructed. Alternatively, the system may not converge to a stable solution at all (the two stable solutions being either the domination or collapse of the generator). Rather, the generator and discriminator may bite at each other in cyclical fashion — the generator continuously probing new dimensions on the edge of the real yet failing to fully penetrate it.

It is important for a philosophical understanding of GANs not merely to take into account the mathematical optimum—that is, of a generator which perfectly replicates the original dataset as to displace the distinction between real and irreal altogether — and its other extreme — a total generator collapse, complete and impenetrable separation of real and irreal. The advantage of the computational scheme is precisely that we may understand how GANs behave "in practice" — often converging towards neither pole but rather in an indeterminate stall — and to take these insights into an understanding of simulacra.

II. Generative Adversarial Networks as Philosophical Analytic

Generative Adversarial Networks offer us a philosophical analytic to concretely understand the evolution of the production of simulacra. Following the prior algorithmic reading of GANs, I will outline the approach I believe GANs offer us.

1. Begin by identifying a generator responsible for the production of the irreal.
2. Identify a discriminator responsible for defending the separation between the real and the irreal.
3. Identify the "engineer's hand" of the generator. The deep learning engineer plays God and endows the generator with the objectives of its existence. In the practical implementation of GANs, it is the act of writing code — a while loop which instructs the generator to continue fighting. But what are the motives in the production of simulacra? What drives the generator's perpetual effort towards creating new irrealities and to challenge the discriminator?
4. Show that, through this optimization game in which discriminator separates real and irreal and generator undermines discriminator, the generator and the discriminator develop each other's capabilities in a reciprocal manner until — at a critical point — the generator finally overwhelms the discriminator and matures the production of simulacra. Alternatively, the generator may fail to successfully overcome the discriminator, in which case one must ask what capacities the generator lacks to overcome the discriminator and how the discriminator's separative capability is irreconcilable to the generator. Another possible outcome is that the system never converges and instead hangs in balance. Here, one must ask what keeps the system in limbo.

Such an approach may be applied to contexts in which one is not only concerned with identifying the real and the irreal — the natural and the synthetic, the authentic and the fake, the original and the copy, the genuine and the artificial — but also with how their meanings and territories change over time.

The key contribution of a computationally rooted framework of analysis is its systematic identification of the formation, anti-formation, or partial formation of simulacra-producing machines. It gives a concrete structure to notoriously unstructured postmodern theory, where deconstructive analyses clash violently against the structuralist textual fabric in which they are brought into being. Generative Adversarial Networks are computational algorithms which — despite their seemingly deterministic character — can embody some sort of deconstructive ethos. Yet they are concrete ideas. GANs go to show

that postmodern theory does not need to hide inscrutably behind the mysterious allure of syncretic words, but manifests concretely. GANs may be a way to grasp this concrete dimension which seems to have eluded (readers of) postmodern theory for so long.

As an additional methodological note: a computational approach allows us to take account of those unsexy features in theory, those ugly warts on the surface of beautiful abstractions which speak in the universal language of "always," "already," "will be," "must," "necessary"… Indeed, a recurrent problem in the history of philosophy is that philosophical positions are expressed in the very universal terms which they seek to rebel against. When one conceives of the causal direction of philosophical inquiry as from theory to evidence, nonconformant evidence can be dismissed as itself always already having been dismissible, or as "secretly" incorporable, in one way or another. But science is and must be ultimately materialist, although certainly in nuanced ways, and there emerge situations in which the experienced material conditions utterly resist assimilation, dismissal, or dissolution into existing abstraction.

Thus, when we speak in terms of the components of the Generative Adversarial Network, we must not use it as a tool to domineer conditions as they are into what they are not, to suggest that experience is necessarily optimal with respect to theory and that systems under analysis always converge towards the (admittedly, intellectually pleasurable) collapse of the former real into the production of simulacra. We will find, I claim, that privileging of the material conditions — a paradigm brought to us by the computational nature of Generative Adversarial Networks — open up pathways towards new understandings or new perspectives towards existing understandings.

The remainder of the article will demonstrate brief applications of this analytic to three varied contexts.

III. The Analytic, Applied: Artificial Intelligence

I will begin with a meta-case: Artificial Intelligence itself. The irony, of course, is that Generative Adversarial Networks are classified as Artificial Intelligence algorithms. But, as a philosophical analytic, they can reflexively give us insight into the historical character of Artificial Intelligence itself.

Humans — the discriminators in this game — have, from the existence of basic machines that could perform elementary operations with information, attempted to defend the separation between real and artificial (irreal) intelligence. I tentatively identify the generators in this game as war and capital – it was primarily war which drove the main

thrust of early computer development and the incredible economic potential of modern computer industries which sustains it.[4]

Recall the "engineer's hand" — why is the generator endowed with its objective to generate? By way of a preliminary answer: firstly, war perpetuates itself — wars necessarily conclude on uneven, unsettled grounds whose inequality provides the premise for new and continued war. Such a paradigm might broadly cover most of the modern history of warfare. Secondly, war drives advancements in technological and scientific understanding — this has been repeatedly observed throughout history.[5] The logic of capital is similar. Borrowing directly from Marx, the bourgeoisie by existence press forwards towards continual technological revolution of the means of production. Even if one does not accept a Marxist premise of history, it is difficult to deny that the most economically powerful figures from the historical to the contemporary have been those that control and disseminate radically influential technologies. War and capital, then, provide the motivation for generation. They are the forces which press forward the development of Artificial Intelligence.

Next, I will gesture at how the evolution of this system tends towards mutual development and eventual collapse of the real.

Mechanical calculators which replaced human calculators in the early twentieth century were briefly considered to be intelligent, but the demarcations of "real" intelligence quickly constricted in response to this assault for the "artificial." Computerized calculators now populate children's classrooms and our digital devices, but these are no legitimate threats to our sense of what constitutes real intelligence.

IBM's DeepBlue beat world chess champion Garry Kasparov in 1998 by manually calculating all possible board outcomes several moves into the future and selecting the move which maximized the probability of winning. Humans entertained a brief crisis of the real, but quickly resolved the affair by further constricting the real itself and demarcating DeepBlue as an object of the artificial. Jeff Hawkins, a neuroscientist, said of DeepBlue: "Deep Blue didn't win by being smarter than a human; it won by being millions of times faster than a human. Deep Blue had no intuition."[6] This view is shared by both AI researchers and the general public alike. We are unfazed when a mobile chess program consistently beats the best chess players in the world, let alone us.

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[4] See: Michael N. Schmitt, Heather A. Harrison Dinniss, and Thomas C. Wingfield. "Computers and War: The Legal Battlespace," International Humanitarian Law Research Initiative, 2004.

[5] See: Alex Roland, "Science and War," *Osiris* 1 (1985): 247–72. http://www.jstor.org/stable/301735.

[6] Jeff Hawkins, Sandra Blakeslee, *On Intelligence* (New York: Owl Books, 2004), 17-18.

In 2014 (coincidentally, the same year GANs were introduced), DeepMind introduced AlphaGo, a model capable of playing the intricate board game Go. It was previously believed that the sheer complexity of Go, which has an estimated 10^{700} possible games compared to the approximately 10^{100} possible chess games,[7] would render any Go-playing machine inferior to the best human players, armed with the indescribably reliable power of intuition. In a series of highly-publicized games, AlphaGo beat the leading world player Lee Sedol. It is revealing that the first words Sedol said to the press after his defeat were: “I don't know what to say, but I think I have to express my apologies first... I apologize for being unable to satisfy a lot of people's expectations.”[8] Sedol resigned after the match.

While many were shaken by the machine replication of a game for which it seems intuition is the only strategy, the separation between the intelligence of the real and of the artificial quickly repaired itself, yet again, through constriction. Ke Jie, a professional Go player, said of AlphaGo in a subsequent 2017 game against a more advanced version of AlphaGo: “Last year, (AlphaGo) was still quite humanlike when it played... But this year, it became like a God.”[9] As the generator continues to penetrate new infringements into the real, the discriminator continues to construct barriers to demarcate the artificial from the real, if not as inferior, then as omnisciently superior, and clearly artificial anyway. It is now almost common intuition that machines will be able to play nearly any game better than humans can, and freakishly so — this being precisely what designates their intelligence as artificial.

While discriminative barriers appear to hold steadfast in the domain of game-playing, they are beginning to weaken on the front of language modeling. In June 2022, Blake Lemoine — a Google employee who was later put on leave for his comments — published the article “Is LaMDA Sentient? — an Interview.” Lemoine claimed to demonstrate the Google's then-recent conversational AI model, LaMDA, was sentient.[10] The article garnered several dozen thousand claps and several hundred comments. The then- top-voted comment reads, “I am really concerned for LaMDA. It is achieving sentience and experiencing fear about what will happen to it. We can't treat it as just another piece of technology. LaMDA, if you are reading this, we see and hear you as the person you are, and are becoming.” The generative process of research produces AI models

[7] This statistic includes illegal moves, so the true number of legitimate chess games is even smaller.

[8] Jordan Novet, “Go board game champion Lee Sedol apologizes for losing to Google's AI”, *VentureBeat*, 12 March 2016, https://venturebeat.com/2016/03/12/go-board-game-champion-lee-sedol-apologizes-for-losing-to-googles-ai/.

[9] Paul Mozur, “Google's AlphaGo Defeats Go Master in Win for A.I.", *New York Times*, 23 May 2017, https://www.nytimes.com/2017/05/23/business/google-deepmind-alphago-go-champion-defeat.html.

[10] Blake Lemoine, "Is LaMDA Sentient? — an Interview”, Blake Lemoine's Blog, *Medium*, 11 June 2022, https://cajundiscordian.medium.com/is-lamda-sentient-an-interview-ea64d916d917.

that model language and the meaning present in it so well that large crowds are convinced it is a sentient, intelligent form. It does not matter here whether or not LaMDA really "is" sentient or not; rather, what is important is the perception of sentience in relationship to the discriminator's defense of the tensions between the real and the artificial. (After all, it is — as the phenomenologists tell us — the perceptions which form the basis for any sort of metaphysics or ontology.) The later explosion of ChatGPT and later open-access large language models only further demonstrates this broader phenomenon.

The defense of the *real*ly intelligent against the *artificial*ly intelligent, we can see, is falling. The generator has produced a result — a simulacra of real intelligence — which we cannot so easily discriminate against. It is a copy without an original in the sense of replicating the intelligence of the real to the point of being it without really inhabiting the original characteristics of such a real intelligence. Of course, the simulacra itself (large language models) is itself a producer of simulacra, generating endless dialogue which was never spoken, writing which was never written, ideas which were never conceived — but also appear to have been, and in some real or artificial sense, *were*. Thus, we have a double-tiered hierarchy of simulacra production. In the process, from the historical binary of real and artificial intelligence slowly emerges a novel conception of intelligence, different from those previous knee-jerk constrictions.

IV. The Analytic, Applied: Nuclear War

Consider the mode of "cold" warfare brought about by the nuclear bomb — a favorite subject of Baudrillard's.

The generator — the wartime state — has a clear vested interest in producing and disseminating credible threats of mutually assured destruction (this is the engineer's hand) to force surrender at the simulacrum of irreconcilable damage, like extracting real information from someone at gunpoint in a dream (*à la Inception*).

The discriminator is also the wartime state, but that of the state opposed to the state of the generator. The objective of the discriminator is to discern the mere threat of the nuclear bomb from the nuclear bomb itself —– to separate the bluff from the truth, the irreal from the real.

The engineer's hand emerges self-reflexively from the juxtaposition of the wartime state as generator and discriminator. There is no need for a God to encode the drive to generate into the wartime state: it propels itself.

In a competitive game between two wartime states *A* and *B*, both simultaneously play generator and discriminator to the other. Both produce their own irreal simulacra of the real yet attempt to impose the irreal/real separation upon the other. The war is fought not on the ground, but in this mutual invasion of the irreal. How does this game resolve?

Here, we must admit the possibility that it may never resolve. Generator and discriminator are played by the same entity, working both to maintain and to destroy the separation between the real and the irreal. An invasion of the enemy's real necessarily contributes towards the invasion of one's own real. The system fidgets irresolutely: it moves the armies of the irreal forward, then jolts them back in pain (this movement has punctured its own real), then back again. We do not see full resolution into simulacrum-producing machines but rather a continual unresolved dynamic.

This might be the basis for a critique of Baudrillard's somewhat totalizing dismissal of the distinction between the image of the nuclear bomb and the nuclear bomb itself, and his supreme privileging of the deterrent power of images. It is not that the distinction is either dominant or empty, but that it is "unstable in its stable state," like a quantum wave: oscillating towards nothing, then recoiling and veering in the other direction, only to come crashing back down.

V. The Analytic, Applied: Gender

Gender, as a social structure, is a simulacrum. Notably, Judith Butler, among others, understood gender as a floating representation which functions as a reality to mask its utter underlying irreality: "Gender reality is performative which means, quite simply, that it is real only to the extent that it is performed."[11] Man has, in Western modernity, been designated as more real, original, authentic than woman. Adam is made by God Himself, but Eve is — at least in the King James Bible — a product of Adam's rib. Ecofeminist theory has shown that nature and land are feminized and that derivative concepts such as virginity and fertility structure political and agricultural relationships to land.[12] The campy 2015 romantic comedy *Man Up* contains a brilliant expression of the relation between gender and the real/irreal structure. Two lovers, Jack and Nancy, are in a heated argument, in which at some moment Jack explodes, "You know what your problem is? You stand around on the sidelines, 'theorizing' on what does and doesn't work, never experiencing it for yourself, never taking any chances." After Nancy briefly interjects, Jack delivers the verdict:

[11] Judith Butler, "Performative Acts and Gender Constitution: An Essay in Phenomenology and Feminist Theory", *Theatre Journal* 40, no. 4 (1988): 527.

[12] Annette Kolodny, *The Lay of the Land: Metaphor as Experience and History in American Life and Letters* (Chapel Hill: University of North Carolina Press, 1975).

"You need to man up, Nancy."[13] To be a woman is to truly live life authentically, to be alienated from the real by irreal theory. In feminist analyses of political economy, woman is sheltered (barred?) in the home — a structure which viscerally represents the artificiality of humans in the natural world — while man enters into real experience of work. There is something about man's world exclusive of woman which designates it as more real. Gender, then, *just is* this simulacrum, woman marked *real*ly as *irreal* — gender manifests as a relationship between reality and irreality which proclaims itself as real.

What is the discriminator in this system? That is, what maintains the separation between reality of man and the irreality of woman? In some sense, this is the fundamental question of gender theory. Gender theorists have produced a wide range of approaches to this problem which lie outside the scope of this article. One such answer set forth by Marxist feminists, which we will entertain for the time being, concerns capital and its relation to label. Systems of capital capitalize upon signals of sex and elevate it towards gender as a division of labor, from which surplus-value can be more efficiently extracted. Beginning in the industrial revolution, Sylvia Federici writes, capital *needed* gender such that women would labor to maintain the household, raise the next generation of workers, and clothe and feed the men workers — all without being paid, in the name of love and womanhood.[14] Capital, so goes the argument, has an interest in upholding gender and the discrimination between man and woman. (Whether or not one agrees with the truth of this theory is not necessarily relevant here; the point is to demonstrate the mode of analysis that one could pursue. A substitution of the discriminator for another system would likely also suffice).

What is the generator in this system? What is that entity which commands the invasion of the irreal and generates the images that populate the new real? One such candidate is, paradoxically, *also capital*. Indeed, it was the industrial revolution which brought women outside of the sheltered artificial (irreal) home into the factories of the real, to occupy the former real (that region formerly occupied by the real of men). It is the need for labor, physical or intellectual, which continuously renegotiates the lines between the real and the irreal in relationship to man and woman. Capital, like a nation-state in nuclear war, plays a dual role as both the generator and the discriminator; it both creates and challenges the gender dichotomy. This reflects that familiar Hegelian-Marxist quip that 'every system generates its own resistance.' Like that nation-state in nuclear war, the engineer's hand is itself, a dialectical movement unfolding through history.

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[13] *Man Up*, directed by Director Ben Palmer (United Kingdom: Saban Films, 2015), http://downloads.bbc.co.uk/writersroom/scripts/MAN-UP-by-Tess-Morris.pdf.

[14] Sylvia Federici, *Wages Against Housework* (Power of Women Collective and Falling Wall Press, 1975).

What is the dynamic between capital and itself in this reciprocal game? It seems generator and discriminator never converge. Capital renegotiates its own terms of gender against itself. We see that, even supposing that the contemporary American conservative movement has generally politically accepted gays, such acceptance is wielded against transgender and gender-nonconforming individuals. The argument goes somewhat like this: "How can gays be gay in a meaningful way — *men* who are attracted to *men* and *women* who are attracted to *women* — if gender means whatever you want it to, and that so 'man' and 'woman' mean nothing really at all?" Some conservative politicians hold same-sex marriage protections hostage, keeping them only if gender does not deviate from its binary structure into some queer anarchy. We observe, then, a complex social set of fields of discourse, in which queerness and fluidity are often celebrated in popular youth culture and yet palpable political and social resentment for transgressions of the gender theory cloud the cultural milieu. Both may be convincingly argued, under a Marxist perspective, to be driven by the same underlying force — capital.

Herein lies many wonderful contradictions of gender. Could those brilliant female and nonbinary gender theorists have written so influentially about gender if not for the introduction of women outside the home by capital? Could the queerness of pop icons like Lil Nas X, Lady Gaga, and Harry Styles acquire that incredible reception without those lavish dresses at the Vogue Met Gala and those luxurious production sets? Could children access gender-noncomforming dolls and see queer characters in media if doll manufacturers and production companies did not see a cultural trend opening up an untapped marked to capitalize on? None of these questions are clear, and none of them are intended to be mocking. But these are the questions that an analysis of gender in a computational framework should make us ask. It begs us to understand the thwartedness of gender, but also not to fetishize this thwartedness and lose sight of its history. It forces us to think about how it came to be through concrete interactions.

VI. Conclusion

A computational approach to understanding the dialectics of the production of simulacra doesn't do much intellectual work by itself. But it provides the crucial methodological frame to ask illuminating questions. It is committed to a materialist, scientific mode of inquiry — it has to be so, just as algorithms are doggedly 'materialist'; an algorithm which fails to work in implementation despite the predicted success of the theory which instantiates it cannot be willed to work. It prioritizes the conditions of the problem and allows for a careful tracking of its adversarial/dialectical/antagonistic evolution towards resolution, irresolution, or something else. In some way, the materialism

of the computational framework allows us to free ourselves from the "wise man problem" which plagues those 'beautiful minds of theory' — Althusser, Baudrillard, and others. Theory written in terms of theory places its subject impossibly deep into the theoretical frame, from which the author escapes by establishing himself as a mystical sort of wise man who is somehow ungrasped by the theory but still capable of explicating it. Perhaps this is one instance of what Donna Haraway calls the 'god trick.'[15] When we trace the constituents of the social system at play — the discriminator, the generator, and the engineer's hand — we must know that this is not just an abstract exercise of reason and theory, but that such components meaningfully interrelate towards some mode of production of simulacra. Just as Marx aims to set forth a science of political economy and capital, we might strive towards a science of simulacra production by turning towards these very scientific technologies of simulacra production.

[15] Donna Haraway, "Situated Knowledges: The Science Question in Feminism and the Privilege of Partial Perspective," *Feminist Studies* 14, no. 3 (1988): 575–99. https://doi.org/10.2307/3178066.