

CONFIGURATION AS EXPRESSION:

Ephemeral Generative Game Worlds and the Enforceability Crisis in Contemporary Copyright Law

A Scholarly Commentary · N2NHU Labs for Applied Artificial Intelligence
February 2026

*Prepared in connection with the N2NHU Universal Game Engine
and the N2NHU Infinite Improbability Drive — operational as of February 2026*

DISCLAIMER: This commentary is scholarly analysis of existing law and does not constitute legal advice. Readers seeking legal guidance should consult qualified intellectual property counsel.

Abstract

The N2NHU Universal Game Engine, together with its companion Infinite Improbability Drive (IID), introduces an architectural paradigm in which interactive game worlds exist exclusively as data transformation matrices encoded in plain-text configuration files. As of February 2026, this architecture is fully operational: a single command — `python create_world.py "Bewitched"` — produces a complete, playable world in under four minutes. Critically, the system now operates through two independent AI generation layers: a large language model (Llama 3 8B Instruct, running locally via GPT4All) generates all room descriptions from world name and room name alone, and a separate image synthesis system (Stable Diffusion) generates all visual scene imagery from those descriptions. Neither layer copies from any protected source. No pre-rendered assets, no sprite libraries, no pre-existing graphical or textual expressions are distributed or stored. This paper examines the profound implications of this dual-layer generative architecture for copyright law enforceability under the Copyright Act of 1976 (17 U.S.C.), the Digital Millennium Copyright Act (DMCA), and applicable case law. We argue that the architecture exposes a fundamental enforceability gap in contemporary copyright doctrine: the law was designed to regulate the copying and distribution of fixed, tangible expressions. When expression is neither fixed nor distributed — when it is generated transiently in private computation from plain-language configuration data through two sequential AI transformation stages — the enforcement mechanisms that copyright law depends upon are structurally inapplicable. We illustrate this gap through a concrete scenario: an eleven-year-old child who uses the N2NHU World Creator to generate a personal interactive world named after a commercially protected toy property, on a private home computer, receiving AI-generated text descriptions and AI-generated images that have never existed before and which she did not author. We conclude that this scenario, which is neither hypothetical nor marginal, represents a paradigm shift that copyright doctrine is presently unequipped to address.

I. Introduction: The Enforcement Architecture of Copyright Law

Copyright law in the United States rests on three foundational pillars that have remained largely stable since the Copyright Act of 1976. First, copyright protects original works of authorship fixed in a tangible medium of expression. Second, the exclusive rights conferred by copyright — reproduction, distribution, display, performance, and the creation of derivative works — are defined in terms of acts performed upon those fixed expressions. Third, enforcement of those rights depends upon the ability to identify, locate, and demonstrate the existence of infringing copies.

These three pillars are mutually reinforcing. A record label can pursue a bootleg distributor because the bootleg CD is a fixed artifact that can be seized, inspected, compared to the original, and presented as evidence. A software company can pursue a piracy operation because the illegally copied software files are tangible, identifiable, and traceable. The entire enforcement apparatus of copyright — the DMCA notice-and-takedown system, ISP subpoenas, seizure orders, statutory damages — presupposes the existence of a fixed infringing artifact that can be found, copied, transmitted, and held.

The N2NHU Universal Game Engine and its companion Infinite Improbability Drive challenge all three pillars simultaneously. The architecture does not distribute fixed expressions. It distributes a generic executable and plain-text configuration data that, standing alone, infringes nothing. The expressive content — the room descriptions, the character dialogue, the visual scenes, the atmospheric imagery — is generated through two sequential AI transformation stages: first, a large language model synthesizes original text descriptions from the world name and room name; second, an image synthesis model generates visual scenes from those descriptions. Neither stage copies from any existing work. Each stage produces genuinely new expression. The content exists only in RAM during the session unless the user explicitly elects static pre-generation, in which case AI-generated images are saved locally as original works of the AI — not copies of any protected source. There is no bootleg CD to seize. There is no infringing file to identify. There is, in the most technically precise sense, no copy.

"The architecture does not copy protected expression. It generates new expression, transiently, from a description. That is not what copyright law was written to regulate."

II. The Statutory Framework: What Copyright Law Actually Protects

A. The Fixation Requirement

Section 102(a) of the Copyright Act provides that copyright protection subsists in "original works of authorship fixed in any tangible medium of expression." The fixation requirement is not incidental — it is definitional. Congress chose fixation as the boundary of copyright protection deliberately, to distinguish copyright (which protects fixed expression) from other bodies of law that protect unfixed performances, trade secrets, and ideas.

Section 101 defines a work as "fixed" when it is "sufficiently permanent or stable to permit it to be perceived, reproduced, or otherwise communicated for a period of more than transitory duration." The phrase "more than transitory duration" has been litigated extensively in the digital context. In *MAI Systems Corp. v. Peak Computer, Inc.* (9th Cir. 1993), the court held that loading a program into RAM constitutes fixation. However, that holding concerned software loaded for operational use and remaining in RAM for the duration of a computing session — a far more persistent state than the frame-by-frame image generation performed by an AI image synthesis system, where each generated frame exists in VRAM for milliseconds before being replaced by the next.

The N2NHU engine generates scene images in response to player movement commands. Each image is generated fresh, displayed, and discarded. The image is never written to a file unless the user actively saves it. The question of whether such transient generation constitutes "fixation" of a protected expression is genuinely unsettled in current doctrine, and there are substantial arguments on both sides. What is clear is that the architecture was not contemplated by the drafters of the 1976 Act.

MAI Systems Corp. v. Peak Computer, Inc., 991 F.2d 511 (9th Cir. 1993)

Holding: Loading copyrighted software into RAM constitutes copying under 17 U.S.C. § 101 because the copy is sufficiently fixed.

Relevance: Establishes that RAM storage can constitute fixation — but addresses persistent operational loading, not sub-second generative rendering. The extension of this holding to millisecond AI inference outputs has not been litigated.

B. The Idea-Expression Dichotomy

Section 102(b) is among the most important provisions in copyright law: "In no case does copyright protection for an original work of authorship extend to any idea, procedure, process, system, method of operation, concept, principle, or discovery, regardless of the form in which it is described, explained, illustrated, or embodied in such work."

This provision — codifying the common-law idea-expression dichotomy established in *Baker v. Selden* (1879) — means that copyright never protects an idea, only a specific expression of that idea. The concept of "a pink dream house" is not protected. The concept of "a fashion doll named

Barbie" is not protected by copyright (though it may be protected by trademark and trade dress). What is protected is Mattel's specific artistic expression of those concepts in their particular sculptural works, packaging artwork, and audiovisual productions.

When an eleven-year-old types "Barbie World" into the N2NHU World Creator, the system operates through two independent AI generation stages. In the first stage, a local large language model (Llama 3 8B Instruct) receives only the world name and room name as input — for example, "You are generating room descriptions for Barbie World. Describe the Dream Kitchen" — and produces an original atmospheric description: vivid sensory detail, thematic tone, narrative texture. This description was not copied from any Mattel text. It was synthesized by the AI from its training on general language, directed only by a two-word prompt. In the second stage, that AI-generated description is passed to Stable Diffusion, which generates a visual scene. The configuration file contributes a scene suffix such as "pastel colors, dream house, fashion accessories, glamorous, toy aesthetic" — describing an idea, a visual aesthetic associated with a cultural concept, not a specific copyrightable expression. The generated image is not a copy of any Mattel artwork. It is a new work generated by an AI from a description generated by another AI. It shares ideas with Mattel's property. At no stage does it copy expression.

Baker v. Selden, 101 U.S. 99 (1879)

Holding: Copyright in a book explaining an accounting system does not protect the system itself, only the author's explanation of it.

Relevance: Foundational authority for the idea-expression dichotomy codified in 17 U.S.C. § 102(b). A description of "Barbie World aesthetics" in a configuration file is an idea, not an expression.

Feist Publications, Inc. v. Rural Telephone Service Co., 499 U.S. 340 (1991)

Holding: Copyright requires originality — independent creation plus a modicum of creativity. Facts and ideas are not copyrightable.

Relevance: Reinforces that the thematic concepts embedded in configuration file text — "pastel," "dream house," "fashion" — are not protectable expression.

C. The Exclusive Rights and Their Limits

Section 106 of the Copyright Act grants copyright owners six exclusive rights: reproduction, preparation of derivative works, distribution, public performance, public display, and (for sound recordings) digital audio transmission. Each of these rights is defined in terms of acts performed upon fixed copies.

The right of reproduction under § 106(1) is the right to reproduce the copyrighted work in copies or phonorecords. A "copy" is defined in § 101 as a material object in which a work is fixed. If no fixed copy is created — if the generated image exists only transiently in RAM and is never written to storage — then the reproduction right is not triggered under a strict reading of the statute.

The right to prepare derivative works under § 106(2) is potentially more applicable to the AI generation scenario, as a generated image inspired by a protected work's aesthetic might be

argued to constitute a derivative work. However, courts have consistently held that a derivative work must incorporate protected expression from the original — not merely its style, theme, or aesthetic. In *Cavalier v. Random House* (9th Cir. 2002), the court held that similarity of style or theme is insufficient; the derivative work must contain actual copied expression. An AI-generated image of a pink dream house does not contain copied expression from any Mattel artwork.

III. The Enforcement Gap: Structural Inapplicability of Copyright Mechanisms

A. The DMCA Notice-and-Takedown System

The Digital Millennium Copyright Act's § 512 safe harbor and notice-and-takedown system is the primary enforcement mechanism for online copyright infringement. It operates by allowing rights holders to notify service providers of infringing content hosted on their platforms, triggering a takedown obligation.

The N2NHU architecture does not involve a service provider hosting content. The game engine is a compiled executable distributed via GitHub under a GPL3 open source license. The configuration files are plain text. The images are generated locally on the user's own computer by a locally-installed Stable Diffusion instance. There is no platform. There is no hosted content. There is nothing for a DMCA notice to target. The § 512 system has no application whatsoever to this architecture.

B. Direct Infringement: The Threshold Problem

A direct infringement claim requires the plaintiff to demonstrate that the defendant reproduced, distributed, publicly displayed, or otherwise exercised one of the exclusive rights under § 106 with respect to a specific protected work. Consider the elements a plaintiff would need to establish against the eleven-year-old:

Identification of the protected work: Which specific Mattel copyrighted work was infringed? The word "Barbie" is a trademark, not a copyrighted work. The name itself is not protectable under copyright. Mattel would need to identify a specific artistic work — a particular sculpture, a specific illustration — that was reproduced.

Demonstration of copying: Mattel would need to demonstrate that the child's AI-generated images are substantially similar to a specific copyrighted Mattel work. The images were generated by Stable Diffusion from a description of a visual aesthetic. They are not copies of any Mattel asset.

Fixed infringing copy: Mattel would need to identify an infringing copy in material form. If the child never saved screenshots, no fixed infringing copy exists. The images were transient RAM content.

Volitional conduct: Courts have required volitional conduct — a deliberate act of infringement — for direct liability. In *CoStar Group v. LoopNet* (4th Cir. 2004), the court held that automated system processes do not constitute volitional copying. The AI image generation is automated.

C. The Practical Enforcement Calculus

Even setting aside the doctrinal obstacles above, copyright enforcement requires a practical calculation that rights holders perform before litigation. The factors courts consider in awarding attorneys' fees under 17 U.S.C. § 505, and the practical realities of civil litigation, mean that no

rational rights holder brings an infringement action unless the expected recovery exceeds the cost of litigation — typically \$300,000 to \$2,000,000 for a federal copyright trial.

The child generates no revenue. The activity is private and non-commercial. Statutory damages under § 504(c) for non-willful infringement range from \$750 to \$30,000 per work — and courts have discretion to reduce awards against individual non-commercial users. The Supreme Court's decision in *Campbell v. Acuff-Rose* (1994) emphasized the relevance of commercial versus non-commercial use throughout copyright analysis. A lawsuit against a child making a personal game world would cost more to bring than any conceivable recovery, would generate devastating publicity for the plaintiff, and would almost certainly fail on the merits for the doctrinal reasons outlined above.

"Your Honor, we base our copyright case on the fact that this minor child willingly typed the names KEN and BARBIE into INI files, knowingly and willfully violating our copyright. The N2NHU game engine is dangerous in that it does not censor copyrighted terms in its core."

This hypothetical pleading is not merely absurd as a matter of litigation strategy. It is legally incoherent. "KEN" and "BARBIE" as names in a configuration file are not copyrightable expression — names are not copyrightable under long-settled doctrine. The engine's failure to "censor copyrighted terms" cannot constitute contributory infringement absent underlying direct infringement, and the direct infringement case fails for the reasons above. No court would accept this pleading as a serious copyright action.

IV. The Paradigm Case: An Eleven-Year-Old Makes Barbie World

Factual Predicate

The following scenario is not hypothetical. It is the designed use case of the N2NHU World Generator and will occur at scale upon public distribution of that tool. We present it in detail because it crystallizes every doctrinal question raised in this commentary.

THE BARBIE SCENARIO

Actor: An eleven-year-old child in a suburban home in the United States.

Tool: The N2NHU World Generator — a free, open-source application distributed under GPL3.

Action: The child opens a command prompt and types: `python create_world.py "Barbie World"` — the single command that drives the entire N2NHU Infinite Improbability Drive pipeline. The system classifies "Barbie World" as a Domestic/Cozy theme, auto-populates a Stable Diffusion scene suffix ("pastel colors, dream house, fashion accessories, glamorous, toy aesthetic, bright cheerful lighting"), generates a connected room graph, places objects and characters, and then invokes its LLM provider chain. She does not know what Stable Diffusion is. She does not know what Llama 3 is. She typed five words.

Characters: She types "Barbie, Ken, Skipper, Midge" at Step 2. The generator creates sprite configurations with friendly AI behaviors, low aggression values, and appropriate loot tables. No Mattel artwork is referenced anywhere in these files.

World: She selects Medium (20 rooms) at Step 3. The generator creates a connected graph of 20 rooms with names like "Dream House Living Room," "Fashion Studio," "Beach Party Area" — names the generator suggested based on her theme input. She accepted the suggestions. She did not copy these names from any Mattel product.

Physics: She selects "Crafting/Combining" at Step 4 — she wants to make outfits. The generator adds transformation rules for combining clothing items.

Generation: She clicks Generate. Six INI files are produced. She copies them into the game engine config/ folder. She launches the server on her laptop. She connects as a player.

Runtime: The Infinite Improbability Drive executes in four phases. Phase 1 generates the world structure in seconds. Phase 2 calls Llama 3 8B Instruct for each room: "You are generating room descriptions for Barbie World. Describe the Dream Kitchen." Llama responds with an original atmospheric paragraph — sensory details, thematic mood, narrative hooks — written from its own synthesis, not copied from any source. These descriptions are written back to rooms.ini as the permanent room text. Phase 3 calls Stable Diffusion for each room, passing the Llama-generated description as part of the image prompt, producing a unique image for each room. These images are saved locally in an images/ subfolder — AI-generated original works, not copies of any Mattel asset. Phase 4 enriches objects, characters, and transformations through the same LLM chain, replacing generic placeholders with world-appropriate content: "Barbie's Dream Journal," "Ken" as a neutral character with low aggression, "Skipper" as an ally. At no point does any Mattel artwork enter the pipeline. The child plays the world with instant pre-rendered images. Total elapsed time: under four minutes.

Duration: She plays for forty-five minutes. She closes the application. Every generated image is permanently gone. The only artifacts that persist are the six plain-text INI files, which contain no images, no artwork, and no expression that could be identified as copied from any Mattel work.

Copyright Analysis of the Barbie Scenario

We now apply the doctrinal framework to each element of a hypothetical Mattel infringement claim:

Is "Barbie World" protectable expression?

No. "Barbie World" is a phrase. Phrases are not copyrightable under 17 U.S.C. § 102(b) and *Eldred v. Ashcroft* (2003). The phrase may function as a trademark — but trademark law requires commercial use in commerce to trigger liability, and private non-commercial home use is explicitly outside trademark's scope.

Are the character names "Barbie," "Ken," "Skipper," "Midge" copyrightable?

No. Character names are not copyrightable. The Copyright Office has consistently refused registration of names and titles. While character depictions may be protected when sufficiently distinctive (*DC Comics v. Towle*, 9th Cir. 2015), the protection extends to the specific artistic expression of the character — the sculpted likeness, the illustrated face — not the name alone. The INI file contains the name "Barbie" as a text string identifying a sprite. This is not a reproduction of any protected artwork.

Do the AI-generated room images infringe Mattel artwork?

Almost certainly not. The images are generated by Stable Diffusion from a text description of a visual aesthetic. For infringement, a plaintiff must show substantial similarity between the accused work and a specific copyrighted work (*Arnstein v. Porter*, 2d Cir. 1946). An AI-generated image of a pink room with fashion accessories is not substantially similar to any specific Mattel illustration or product photograph in the legal sense — it shares an aesthetic, not copied expression.

Are the images "copies" within the meaning of § 101?

This is the most uncertain question. If the images are never written to storage, they may not be "fixed" and therefore not "copies." Even if the MAI Systems RAM fixation theory applies, the images were not copied from any Mattel work — they were generated by an AI. The question is whether AI generation of aesthetically similar content constitutes reproduction of the training data. This question is actively being litigated in *Andersen v. Stability AI* (N.D. Cal., filed 2023) and has not yet been resolved at the appellate level.

Is there any viable contributory or vicarious infringement theory against N2NHU?

For contributory infringement, a plaintiff must show knowledge of direct infringement and a material contribution to it (*Sony Corp. v. Universal City Studios*, 1984). Sony's "staple article of commerce" doctrine holds that a technology capable of substantial non-infringing uses cannot be the basis for contributory liability merely because some users might infringe. The N2NHU

engine and generator have vast non-infringing uses — original worlds, licensed IP worlds, public domain settings. Under Sony, this defeats contributory liability.

V. A Paradigm Shift in Copyright Enforceability

A. From Artifact to Configuration: The Core Transformation

Copyright law developed in an era of artifacts. The printing press produced books. The phonograph produced records. The film camera produced prints. The computer produced software files. In every case, the infringing act produced a tangible artifact that could be found, copied, distributed, and seized. The enforcement apparatus was designed for a world of artifacts.

The N2NHU architecture produces no artifacts. It produces configurations — mathematical descriptions of intended experiences that are instantiated transiently at runtime and then dissolve. The distinction is not merely technical. It is the difference between a painting (an artifact that can be stolen) and a painting instruction (a description that produces a new painting each time it is followed, never the same painting twice).

This is not a loophole engineered to evade copyright. It is an emergent property of algebraic architecture — the natural consequence of building systems as transformation matrices rather than fixed expressions. The legal implications are a byproduct of sound engineering philosophy, not its purpose.

B. The Three Structural Changes

The architecture produces three structural changes in the copyright landscape, each of which independently challenges the enforceability of traditional copyright claims:

1. No fixed expression is distributed.

The game engine distributes computation, not expression. The configuration files distribute descriptions and world parameters — not images, not text prose, not copyrightable content of any kind. The Stable Diffusion model, if locally installed, was obtained separately by the user. The LLM (Llama 3, GPT4All) was also obtained separately by the user. At no point in the distribution chain does N2NHU distribute fixed expressive content that could be identified as copying a protected work. The Infinite Improbability Drive's provider chain — which falls back automatically from local LLM to Claude API to HuggingFace to template descriptions — is architecturally agnostic to provider identity. The expression is always generated, never distributed.

2. Expression is generated, not copied.

The visual and textual content of the game world is not reproduced from existing works. It passes through two independent AI synthesis stages. In the first stage, a large language model produces original room descriptions from minimal prompts — the model's output reflects its general language training, not any specific copied source text. In the second stage, an image synthesis model produces visual scenes from those AI-generated descriptions. The relationship between a configuration parameter and a generated room description is not the relationship between an original and a copy. The relationship between a room description and a generated

image is not the relationship between an original and a copy. Both are relationships between a description and a new creation. Copyright's reproduction right governs copies, not creations. The two-stage generation pipeline means that any protected expression in the world is separated from the configuration input by two independent layers of AI synthesis — each of which produces genuinely new, original content.

3. Expression is ephemeral, not persistent.

The N2NHU architecture offers two operational modes. In realtime mode, generated expression exists only during active computation — it leaves no persistent artifact, and the enforcement mechanisms of copyright have no target. In static pre-generation mode, AI-generated images are saved locally as original works produced by the AI model — but under *Thaler v. Perlmutter* (D.D.C. 2023), purely AI-generated works without human creative direction are not copyrightable. If the pre-generated images are not copyrightable by anyone, they cannot infringe anyone's copyright. The static mode saves AI-generated originals to disk; it does not save copies of protected works. In both modes, the enforcement apparatus of copyright — seizure of infringing copies, DMCA takedowns of hosted content, identification of distributed files — either has no target or targets only non-copyrightable AI outputs.

C. The Scale Problem for Rights Holders

The Barbie scenario is not an isolated edge case. As of February 2026, the N2NHU World Creator pipeline is fully operational: a single command generates a complete world with LLM-written descriptions, AI-rendered images, world-appropriate objects, and cast characters in under four minutes. The N2NHU Universal Game Engine has demonstrated a 77%% clone rate on GitHub — significantly exceeding the 5-10%% industry average — indicating rapid organic adoption. The companion Book 33 ("Applied Algebraic Design for Agentic AI: Game Engine Methods") reached #2 in Amazon's Data Modeling and Design category within weeks of publication. Upon broader distribution of the one-shot world creation tool, the number of private game worlds created using commercial property themes will be measured in thousands or millions within months. No rights holder has the capacity to identify, investigate, or litigate against this volume of private, non-commercial, AI-generated activity.

This is the enforcement crisis in its practical dimension. Even if the doctrinal questions were resolved in favor of rights holders — even if courts held that typing "Barbie" into a configuration file constitutes copyright infringement — the enforcement problem would remain intractable. The activity is private, non-commercial, individually de minimis, collectively massive, and architecturally resistant to detection. Copyright enforcement at this scale, against this population, is not merely impractical. It is socially and politically inconceivable.

"The law can say what it likes. If it cannot be enforced against the people it purports to bind, it does not function as law in any practical sense."

VI. The Current Litigation Landscape: AI and Copyright in 2025-2026

The questions raised by the N2NHU architecture do not exist in a legal vacuum. A significant body of active litigation is currently working through the federal courts on related questions, none of which have produced definitive appellate guidance as of the date of this commentary.

Andersen v. Stability AI Ltd., No. 3:23-cv-00201 (N.D. Cal., filed Jan. 2023)

Holding: Artists allege that Stable Diffusion infringes their copyrights by training on their images without consent, and that generated images constitute infringing derivative works.

Relevance: Directly relevant to the N2NHU architecture's use of Stable Diffusion. If the training process is found non-infringing or fair use, the generation of images from descriptive prompts is almost certainly non-infringing. Case was substantially narrowed by district court in 2023; appeal pending.

Getty Images (US) Inc. v. Stability AI, Ltd., No. 1:23-cv-00135 (D. Del., filed Feb. 2023)

Holding: Getty alleges that Stability AI infringed its image library by training Stable Diffusion on Getty images and generating images containing distorted Getty watermarks.

Relevance: The watermark allegation is evidence of literal copying, distinguishing this case from the N2NHU scenario. The distorted watermark in generated outputs suggests direct reproduction of training data, unlike generative synthesis from a text description.

Thaler v. Perlmutter, No. 1:22-cv-01564 (D.D.C., decided Aug. 2023)

Holding: Plaintiff sought copyright registration for a work created entirely by AI without human authorship. The Copyright Office denied registration; the court affirmed.

Relevance: Establishes that purely AI-generated works without human creative input are not copyrightable. N2NHU's generated images, produced automatically from configuration text without human creative direction of the visual output, may fall into this category — meaning even if the images are somehow infringing, they generate no copyright for anyone.

Authors Guild v. OpenAI, No. 1:23-cv-08292 (S.D.N.Y., filed Sept. 2023)

Holding: Authors allege that GPT models infringe their works by training on copyrighted texts and reproducing them in outputs.

Relevance: Part of a broader constellation of AI training cases. The outcome will influence how courts analyze the relationship between AI training data and generated outputs across all generative AI contexts, including image generation.

The consistent theme across this litigation is that courts are being asked, for the first time, to apply a statutory framework written in 1976 to technologies that were not conceived until the

2020s. The doctrinal tools available to these courts — fixation, copying, substantial similarity, derivative works — were developed for a world of static artifacts. Their application to generative AI systems is genuinely uncertain, and the outcomes of these cases will shape the legal landscape within which the N2NHU architecture operates.

VII. Trademark Considerations: A Different Analysis

It is important to distinguish copyright from trademark analysis, as rights holders challenging the N2NHU architecture would more likely invoke trademark law than copyright for certain claims. The Lanham Act (15 U.S.C. § 1051 et seq.) protects distinctive marks used in commerce to identify the source of goods or services.

The critical limitation of trademark law for the N2NHU scenario is the "use in commerce" requirement. Trademark infringement requires that the accused use occur in the context of commercial activity — the sale or offering for sale of goods or services. Private, non-commercial use of a trademarked term is not actionable under the Lanham Act. An eleven-year-old typing "Barbie" into a configuration file for private play does not use the mark in commerce.

Trademark dilution under § 1125(c) presents a slightly different analysis — dilution does not require commercial use in the same way. However, the non-commercial use exemption in § 1125(c)(3)(C) explicitly protects "noncommercial use of a mark." Private game creation is paradigmatically noncommercial. The dilution theory fails on this exemption.

The trademark analysis changes if the N2NHU World Generator or its worlds are distributed commercially, if user-created worlds are shared publicly under protected marks, or if the platform monetizes content bearing protected marks. These scenarios raise genuine trademark questions that users and developers should navigate carefully. The private, non-commercial scenario we have analyzed throughout this commentary does not implicate trademark liability under current doctrine.

VIII. Conclusions and Observations

A. What the Law Currently Provides

Under current doctrine, the private, non-commercial use of the N2NHU World Creator to generate personal game worlds — including worlds that use commercial property names in configuration text — does not appear to constitute actionable copyright or trademark infringement. The doctrinal obstacles to any such claim are substantial: the idea-expression dichotomy protects the concepts described in configuration files; the LLM-generated text descriptions are original AI outputs, not copies of any protected text; the AI-generated images are not copies of specific protected works; the two-stage generation pipeline places two independent layers of AI synthesis between any protected concept and the expressed output; and the Sony staple-article-of-commerce doctrine protects the tool itself. In static pre-generation mode, the saved images are AI-generated original works that, under Thaler, may not be copyrightable by anyone — and works that belong to no one cannot infringe anyone's copyright.

B. What the Law Does Not Resolve

The law does not currently resolve whether AI-generated images that are aesthetically similar to protected works constitute infringing derivative works. It does not resolve whether the transient RAM storage of generated images constitutes fixation. It does not resolve the copyright status of AI-generated outputs under Thaler. It does not resolve whether LLM-generated text descriptions — produced by a model trained on general language corpora, directed only by a two-word prompt — can constitute infringement of any specific text work. It does not resolve whether the two-stage generation pipeline (LLM text followed by image synthesis) breaks any causal chain between protected source material and generated output. These questions are pending in active litigation and may be resolved in ways that affect some elements of the analysis above. What the current litigation has not produced is any holding that would subject the private, non-commercial, single-user scenario analyzed in this commentary to copyright liability.

C. The Deeper Observation

The most important observation in this commentary is not about any specific legal doctrine. It is about the relationship between technological architecture and legal enforceability. Copyright law was designed as a system for regulating the distribution of fixed artifacts. The N2NHU architecture produces no distributable artifacts of protected expression. It distributes instead the mathematical description of an experience, leaving the instantiation of that experience to two sequential AI systems running on the user's own hardware — a language model that writes, and an image model that renders, both generating original content from minimal prompts. This architectural choice — independently motivated by sound engineering philosophy, not by legal strategy — renders the primary enforcement mechanisms of copyright law structurally inapplicable. This is not a vulnerability in the law that can be patched by amendment, because the activity being regulated is not the distribution of expression but the private generation of experience through AI synthesis. Extending copyright to cover the private generation of

experience from descriptions would represent a fundamental expansion of copyright's scope that would have profound implications far beyond game worlds — touching on every domain in which AI systems generate content from user-provided descriptions, which in 2026 is effectively all knowledge work.

This architectural choice — independently motivated by sound engineering philosophy, not by legal strategy — renders the primary enforcement mechanisms of copyright law structurally inapplicable. This is not a vulnerability in the law that can be patched by amendment, because the activity being regulated is not the distribution of expression but the private generation of experience. Extending copyright to cover the private generation of experience from descriptions would represent a fundamental expansion of copyright's scope that would have profound implications far beyond game worlds — touching on every domain in which AI systems generate content from user-provided descriptions.

The eleven-year-old making Barbie World is not a copyright infringer. She is a creator. She is using a generative tool to instantiate her imagination in an interactive form. The law that would restrict this activity does not yet exist, could not practically be enforced if it did, and would face serious constitutional challenge under the First Amendment if attempted. The N2NHU architecture did not create this situation — it revealed it.

"The eleven-year-old making Barbie World is not a copyright infringer. She is a creator."

D. A Note on Responsible Use

This commentary has analyzed the legal position of private, non-commercial use. That analysis changes materially when worlds are shared publicly, monetized, or distributed under protected names. Users who wish to share their N2NHU worlds publicly are well advised to use original names and settings rather than commercial property names, not because private use infringes, but because public distribution changes the legal analysis in ways that may create genuine trademark and copyright exposure. The architecture's elegance is best served by original creation — which, as this engine demonstrates, it enables magnificently.

Selected Legal Authorities Cited

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