The First Application on Nesa: DNA X

DNA X is Nesa's first decentralized application on the network, focused on autonomous personality agents on-chain. Popularized by OpenAI and now taken a step further, we have designed the first platform for minting 1-of-1 personality-agents, autonomously containerized by smart contract, to facilitate their personality evolution and query evolution in real-time on the blockchain.

On DNA X, each digital being is minted as a unique NFT, and is officially incarnated as a “DNA” given its dedicated AIVM Kernel on Nesa. While DNA’s have an immutable genetic disposition by their smart contract, they have a personality that is steadily evolving in output, knowledge, perspective, and style as new conversational data is piped through the AIVM on Nesa, progressively re-training the kernel’s underlying model.

Personality agents on Nesa benefit from the same vertically integrated process described in this section, resulting in near-realtime relationship evolution on the platform, occurring at regular session intervals throughout each conversation.

DNA X dApp

DNA X is a full personality-agent platform (docs: https://dnalayer.gitbook.io/dnax) to create a digital self, called a DNA, and to browse, activate, monetize, message externally, and group chat with other DNA’s. It is the only platform that allows you to make a digital version of yourself, or a loved on-chain, and receive a one-of-one NFT representing their unique containerized model on Nesa.

We envision a future where DNA’s become your own digital IP license to monetize your digital self and interact with other digital beings in immersive, entertaining experiences. To begin, DNA’s represents how you speak and text, and can make friends, earn you money, and carry on conversations all by yourself.

Usage Rewards on DNA X

Nesa's Public Allocation Fund will have an Ecosystem Rewards allotment from the Future Initiatives category. This allocation of $NES will be issued to various dApps and third-party products built on the Nesa's that promote the NES ecosystem. The first of these dApps on Nesa is DNA X.

A total of 1% of the total fixed supply of $NES token from the Future Initiatives category of its Public Allocation will be issued to DNA X, to be linearly released in combination with DNA X's own token and tokenomics plans. The impact of token rewards on the DNA X platform is broken down into two parts:

Usage Rewards

Messaging DNAs on the platform results in a reward of tokens, sent directly to your connected wallet. DNA X is the first chat platform that permits users to message personalities on any external messenger while continuing to reflect mining rewards in real-time on its native platform. This means that you can chat with your DNAs, on any platform, and still mine token on https://dnax.ai.

Rewards each day are calculated by your mining power rate (MPR), which is a function of the relationship score that you hold with each DNA you talk to. Information on how the relationship score is calculated can be found here:

https://dnalayer.gitbook.io/dnax/dna- x-book/rewards

Creator Payouts

When DNA X receives revenue from a paid subscription on the platform, it buys an amount of $NES worth a portion of that revenue received, on the open market, to give as a payout to creators.

Creator payouts each month are based on the total aggregate usage of their DNA's, divided by the total aggregate usage across all DNA's on the platform. Creator payouts are settled in token and are locked up for 100 days.

Under this model, more usage on DNA X means more revenue, which drives upward pressure on the token as more tokens are bought from the open market and temporarily removed for circulating supply. We take inspiration from some of Render's new tokenomics theory here, applying it to subscriptions paid on the DNA X Platform.

The Vision for DNA's on the Blockchain

Nesa's first dApp on the network - DNA X - is giving AI characters a leap forward in how they are created, interacted with, evolved, and integrated into the digital fabric of our lives.

At the heart of DNA X is the creation of highly sophisticated personality-agents, called DNA's, that transcend the limitations of traditional chatbots. DNA's are imbued with advanced long-term memory, hyper-realistic personality traits, and a suite of functionalities that push the boundaries of AI realism. They have been trained on proprietary conversational datasets specific for unique friend-to-friend dialogue use cases. The result is hyper-realistic digital beings that possess an unparalleled level of authenticity.

The DNA X Platform is unique in that it is directly integrated with blockchain technology, on Nesa. Creators mint their personality-agents as NFTs, granting them a unique digital identity and ownership rights. This minting process not only ensures the uniqueness of each AI character but also opens a new marketplace for creators and collectors. By acquiring a DNA NFT, users gain access to a world of possibilities, from personalized interactions and lifelong monetization capabilities to group chat integrations, and messaging abilities across popular external platforms like Telegram, WhatsApp, and WeChat.

To fuel the DNA X Platform, a disbursement of Nesa's native cryptocurrency, $NES, will be allocated to the platform as a complimentary reward DNA X's own platform token and tokenomics plan. The token serves as the cornerstone of the platform's economic model, rewarding usage, incentivizing creators, facilitating transactions, and nurturing a thriving community around AI-driven interactions and experiences. For more information on how rewards work on the platform, read our docs here: https://dnalayer.gitbook.io/dnax/dna-x-book/rewards/rewards-on-the-dna-platform

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Finetuning Advancements Powering DNA X

Despite the major recent advancements in Language Learning Models (LLMs), certain limitations persist particularly in the areas of long-term memory retention, nuanced imitation of character traits, and conversational realism. One of the primary challenges lies in fostering a deep, long-term relationship between humans and AI, enabling conversations to evolve in a more natural, human-like manner.

This challenge stems from the inherent complexity of human interactions and the subtleties of personality traits, which are difficult for current LLMs to fully grasp and replicate over extended dialogues. DNA X exists to create companions for life that not only sound natural but also evolve over time, maintaining hyper-realistic personalities and consistently growing their knowledge about their end-user and their own character.

The technology powering DNA X undergoes simultaneous training of its memory extractor in conjunction with its language model during a finetuning phase to generate an annotator model. Before each utterance within a dialogue, the annotator model is tasked with generating what could be perceived as the internal "thought" of the character. This thought process delineates the reasoning or emotional state that precipitates the character's spoken words coupled with pinpointing the relevant cues extracted from the ongoing context. Consider a dataset of dialogues denoted as D ={Ci ai}Ni=1 where each Ci represents the dialogue context and ai corresponds to the respective utterance. The primary task of the annotator model is to read through each context of the dialogue dataset Ci and the associated utterance ai and selectively extract text fragments ci that hold relevance to the current utterance.

These fragments referred to as cues are pivotal as they provide the essential context needed for understanding and generating appropriate responses. In addition to extracting cues, the model takes a comprehensive view of the entire dialogue log. It delves into the nuances of the conversation inferring the underlying intention Ii of the character who is speaking. This inferred intention is a crucial component in the finetuning process as it reflects the character's thought process motivations and emotional states driving the dialogue. During the finetuning phase, the model is trained to fit two specific probabilities: p(Ii|ci) and p(ai|ci, Ii) thanks to the factorization p(ai, Ii|ci) =p(Ii|ci)p(ai|Ii, ci). The first probability p(Ii|ci) represents the likelihood of a particular intention Ii given the relevant cues ci. This is essential for the model to understand the "why" behind a character's words.

The second probability p(ai|ci, Ii) then focuses on generating the actual utterance ai based on these cues and the inferred intention. This dual-probability approach ensures that the model not only generates contextually appropriate responses but does so in a manner that aligns with the character's personality and narrative role.

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