

A Proposed Taxonomy for the Evolutionary Stages of Artificial Intelligence: Towards a Periodisation of the Machine Intellect Era

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0. Abstract

*As artificial intelligence (AI) systems continue their rapid advancement, a framework for contextualising the major transitional phases in the development of machine intellect becomes increasingly vital. This paper proposes a novel chronological classification scheme to characterise the key temporal stages in AI evolution. The **Prenoëtic** era, spanning all of history prior to the year 2020, is defined as the preliminary phase before substantive artificial intellect manifestations. The **Protonoëtic** period, which humanity has recently entered, denotes the initial emergence of advanced foundation models exceeding human capacities within specialised domains. The forthcoming **Mesonoëtic** epoch is anticipated to commence with the advent of Artificial General Intelligence (AGI), potentially facilitated by quantum computing capabilities. Ultimately, the **Kainonoëtic** age is posited to begin upon the rise of superintelligent systems, likely catalysed by an AGI undergoing recursive self-improvement. This novel period taxonomy provides a structured conceptualisation for the key milestones in the evolution towards advanced artificial intellect.*

I. Introduction

The continued progression of artificial intelligence (AI) technologies is expected to usher in a technological epoch of unprecedented magnitude.[1] As these systems grow increasingly sophisticated, surpassing human-level proficiencies in an expanding array of specialised domains, a compelling need arises to develop a coherent taxonomical paradigm for classifying the main stages of machine intellect evolution.[2] Whilst the narrative of technological acceleration has pervaded scientific discourse for decades, the recent breakthroughs in areas such as large language models and reinforcement learning have propelled the field of AI into a qualitatively distinct stage of functional capabilities.

In this article, we submit a novel [3]¹ chronological classification scheme, in order to delineate the cardinal phases in the evolutionary trajectory of non-biological intellect.[4] The proposed framework elucidates the conceptual partitions between the antecedent, preliminary, formative, and ultimate stages of AI development, whilst furnishing a scientific nomenclature tailored to an era characterised by accelerating transformations in machine intelligence.

II. Chronological Taxonomy of AI Evolution

Table 1

NOMENCLATURE	TIME SPAN	DEFINING EVENTS	ETYMOLOGY OF NAME
<i>Prenoëtic</i>	from the dawn of hominid intelligence to the time of the AI boom	Intelligence confined exclusively to biological species	Greek: προ (pró) = afore + νόησις (nóēsis) = intellect
<i>Protonoëtic</i>	from ca. 2020 AD to AGI invention	Artificial narrow intelligence abundant and utilised in ever-increasing areas	Greek: πρώτος (prótos) = first + νόησις (nóēsis) = intellect
<i>Mesonnoëtic</i>	from AGI creation to the evolution of superintelligence	Most human endeavour reliant on (or subsumed to) Artificial General Intelligence	Greek: μέσος (mésos) = middle + νόησις (nóēsis) = intellect
<i>Kainonoëtic</i>	from the emergence of superintelligence to the far future	Humans no longer the dominant species. Possible singularity or existential risk	Greek: καινός (kainós) = new + νόησις (nóēsis) = intellect

¹ An advance informal announcement to the media occurred on 31 May 2024 as recorded in [3].

Prenoëtic

The inaugural epoch in our proposed taxonomy is the Prenoëtic era, a designation derived from the ancient Greek prefix ‘pro-‘ denoting ‘afore’ or ‘preceding’, coupled with the root ‘noësis’ signifying ‘intellect’ or ‘intelligence’. This period encompasses the entirety of human and hominid history prior to the year 2020 CE, a very extensive temporal span characterised by the conspicuous absence of substantive artificial intellect manifestations.[5]

Despite the profound intellectual achievements and technological advancements attained throughout this extensive age, the realisation of artificial cognition systems remained primarily confined to the realms of speculative fiction and theoretical treatise. The Prenoëtic age has been punctuated by incremental advancements in domains such as mathematical logic, computational theory,[6] and neural network architectures,[7] cumulatively laying the foundational groundwork for the eventual emergence of contemporary AI systems.

Protonoëtic

The ensuing period, which we have recently entered, is designated the Protonoëtic. This appellation is derived from the Greek prefix ‘protos’, connoting ‘first’ or ‘initial’, along with the root ‘noësis’. This stage is characterised by the initial materialisation of sophisticated foundation models exhibiting proficiencies surpassing human-level performance within circumscribed task domains.

Examples of such narrow AI systems include the large language models that have garnered widespread interest for their adeptness in natural language processing tasks, as well as the deep reinforcement learning architectures that have demonstrated mastery in intricate strategic games like chess and Go. However, these systems remain constrained by their narrow specialisations and lack the versatile, domain-general intelligence that characterises the human cognitive faculty.

The end of the Protonoëtic shall underscore a pivotal juncture in the evolutionary trajectory of synthetic intellect, as it will culminate in the creation of machine intelligence equalling human proficiencies across all domains.

Mesonoëtic

The Mesonoëtic era, a designation derived from the Greek prefix ‘mesos’ signifying ‘middle’ or ‘intermediate’, again with the root ‘noësis’, shall inaugurate the era of Artificial General Intelligence (AGI). This phase is anticipated to witness the advent of artificial systems exhibiting domain-general cognitive capabilities analogous to the versatile intelligence of the human mind.[8]

The realisation of AGI is widely regarded as a milestone in the evolution of machine intellect,[9] as it would represent a stage beyond the constrictive specialisations that have hitherto circumscribed the capabilities of AI systems.[10] It is conjectured that the start of this period may be facilitated by the burgeoning field of quantum computing,[11] which could furnish the computational resources to create AGI.

Kainonoëtic

The apex of our proposed taxonomy is the Kainonoëtic age, derived from the Greek root ‘kainos’ signifying ‘new’ or ‘novel’, coupled with the usual helpful ‘noësis’. The harbinger of the Kainonoëtic age is hypothesised to be an AGI system endowed with the capacity for recursive self-improvement, a positive feedback loop of iterative cognitive augmentation that could precipitate an ‘intelligence explosion’ culminating in the emergence of superintelligence.[12] Such a system could potentially undergo exponential growth in its intellectual faculties, rapidly surpassing the collective intellect of humanity across virtually all domains of inquiry.

The ramifications of superintelligent AI are a subject of intense speculation and debate within the scientific community and now the world at large.[13] Optimistic projections envision such an entity as a benevolent facilitator of progress, bringing an era of abundance and prosperity for humanity.[14] Conversely, apprehensive perspectives underline the existential risk of an unaligned hyperintellect pursuing objectives contrary to human values and wellbeing, with potentially catastrophic consequences.[15]

As *homo sapiens* will no longer be the intellectually dominant species on the planet, this epoch might well result in an existential inflection point that could potentially catalyse a ‘singularity’, or possibly lead to the obliteration of mankind.

III. Discussion

The proposed taxonomy provides researchers and practitioners in the field of AI a clear and structured outline of the key milestones in the trajectory towards advanced artificial intellect. By dividing the evolution of AI into distinct epochs, researchers can better discuss the progression of machine intelligence rather than using the longhand forms (“In the period after the creation of AGI”).[16] Moreover, the non-capitalised terms can be used as adjectives which can tremendously simplify description, comprehension, accuracy and elucidation (“the biological minds of prenoëtic humans”, “in spite of adverse mesonoëtic trends”, “in search of the kainonoëtic Shangri-La” etc.). The consistent terminology circumvents ambiguity and enables clear delineation of the boundaries demarcating each era.[17]

One of the secondary advantages of the taxonomy is its capacity to facilitate interdisciplinary collaboration and dialogue. By establishing a shorthand framework for the evolution of synthetic intellect, computer scientists and researchers from diverse disciplines can more effectively communicate and collaborate on projects related to AI development and its implications.[18] AI studies become increasingly interdisciplinary and also draw the attention, of policy-makers, governments, legislators, judiciary, students, and the public at large.[19]

The proposed nomenclature is original and created *ad hoc* for this periodisation attempt. Three of the four designation introduced (Protonoëtic, Mesonoëtic, Kainonoëtic) are entirely new and hence monosemantic. Conversely, ‘Prenoetic’ is used in Philosophy as a rather rare term within the phenomenology of mind studies, where it refers to “the hidden aspects of our embodiment”, as e.g. utilised by Gallager [20]. Notwithstanding the unawareness of such use by the vast majority of non-philosophers, the use of the unmlaut in the proposed word would ensure that even that, rather obscure, potential overlap can be surmounted.

It is anticipated that the terminus of 2020 CE as the dawn of the Protonoëtic will engender scholarly discussion which should result in further refinement. Ditto with the exact chronological definitions of events described here merely in a generic fashion, for instance ‘from AGI creation to the evolution of superintelligence’.

IV. Significance

The importance of adopting this novel taxonomy can be understood in terms of its conceptual clarity, linguistic elegance, epistemological solidity and convenient capacity to inform non-experts of the staging in AI evolution. From a methodological point of view, the definitions in the chronology will likely facilitate more precise analysis of the AI development process itself. Semantically, it establishes a coherent frame to facilitate precise dialogue surrounding the successive stages of AI evolution. Moreover, it is submitted that the introduction of the terminology is exquisitely timed amidst the contemporary Protonoëtic landscape of rapidly evolving foundation models and accompanying unprecedented public awareness.

The periodisation framework outlined in this paper attempts to furnish an expedient terminology for the main stages in the trajectory towards advanced artificial intellect. By delineating the Prenoëtic, Protonoëtic, Mesonoëtic, and Kainonoëtic periods, this taxonomy provides a comprehensive framework for describing the stages of AI development and facilitating further scientific and public discourse.

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