The Yang Program: A Universal Recursive Framework from meta to META

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Abstract

The Yang Program is a boundlessly recursive, infinitely extensible framework that encompasses all conceivable meta-structures of knowledge, progressing from meta through Meta, MEta, METa, META, and culminating in $\mathbb{META}$. This ultimate meta-level, $\mathbb{META}$, represents an infinite recursion of meta-iterations, integrating all known and potential future academic disciplines and structures within a single universal system. This document also addresses the theoretical impossibility of constructing an "X Program" that strictly includes the Yang Program as a sub-program, due to the all-encompassing and self-recursive nature of $\mathbb{META}$.

1 Introduction

The Yang Program establishes a hierarchical framework for recursive meta-structures, progressing naturally from meta to Meta, MEta, METa, and META, with $\mathbb{META}$ as the ultimate level symbolizing infinite encapsulation. This structure allows the Yang Program to unify all interdisciplinary and meta-interdisciplinary knowledge across any conceivable domain or abstraction, positioning it as a universal system.

2 Definitions and Meta-Level Hierarchies

Each level in the Yang Program represents a broader abstraction, with each successive symbol (meta, Meta, MEta, METa, META) signifying increasingly comprehensive recursive structures.

2.1 Base Meta Level: meta

Define the base structure meta_n^0 by:

$$\mathrm{meta}_n^0 := \underbrace{\mathrm{meta} - \mathrm{meta} - \underbrace{\mathrm{meta} - \cdots - \mathrm{meta}}_{n \text{ times}}}$$

The projective limit for these structures is defined as:

$$\mathrm{meta}^{1,+} := \varprojlim_{n \in \mathbb{Z}^+} \mathrm{meta}_n^0$$

with $\mathrm{meta}^{1,-}$ defined similarly for $n \in \mathbb{Z}^-$, and:

$$\mathrm{meta}^1 := \mathrm{meta}^{1,+} \cup \mathrm{meta}_0^1 \cup \mathrm{meta}^{1,-}$$

2.2 Progression through Meta, MEta, METa, and META

For each level, define the recursive sequence. For example, for Meta:

$$\mathrm{Meta}_n^0 := \underbrace{\mathrm{Meta} - \mathrm{Meta} - \underbrace{\mathrm{Meta} - \cdots - \mathrm{Meta}}_{n \text{ times}}}$$

and the projective limit for Meta:

$$\mathrm{Meta}^{1,+} := \varprojlim_{n \in \mathbb{Z}^+} \mathrm{Meta}_n^0$$

with the unified structure:

$$\mathrm{Meta}^1 := \mathrm{Meta}^{1,+} \cup \mathrm{Meta}_0^1 \cup \mathrm{Meta}^{1,-}$$

Similarly, define higher abstractions for MEta, METa, and META:

$$\mathrm{MEta}_n^0 := \underbrace{\mathrm{MEta} - \mathrm{MEta} - \underbrace{\mathrm{MEta} - \cdots - \mathrm{MEta}}_{n \text{ times}}}, \quad \mathrm{METa}_n^0 := \underbrace{\mathrm{METa} - \mathrm{METa} - \underbrace{\cdots - \mathrm{METa}}_{n \text{ times}}},$$

$$\mathrm{META}_n^0 := \underbrace{\mathrm{META} - \mathrm{META} - \underbrace{\cdots - \mathrm{META}}_{n \text{ times}}}$$

and take the projective limits:

$$\mathrm{META}^{1,+} := \varprojlim_{n \in \mathbb{Z}^+} \mathrm{META}_n^0, \quad \mathrm{META}^1 := \mathrm{META}^{1,+} \cup \mathrm{META}_0^1 \cup \mathrm{META}^{1,-}$$

3 Infinite Recursion and $\mathbb{METTA}$

Define the limit of infinitely recursive meta-levels, culminating in $\mathbb{METTA}$.

3.1 Recursive Structure for Each Level

For each of the symbols meta, Meta, MEta, METa, and META, define:

$$\mathrm{meta}^\infty := \lim_{m \to \infty} \mathrm{meta}^m, \quad \mathrm{Meta}^\infty := \lim_{m \to \infty} \mathrm{Meta}^m, \quad \mathrm{MEta}^\infty := \lim_{m \to \infty} \mathrm{MEta}^m,$$
$$\mathrm{METa}^\infty := \lim_{m \to \infty} \mathrm{METa}^m, \quad \mathrm{META}^\infty := \lim_{m \to \infty} \mathrm{META}^m$$

To capture an infinitely recursive hierarchy, define:

$${}^n\mathrm{meta}^\infty := \mathrm{meta}^{\underbrace{\infty, \ldots, \infty}_{n \text{ times}}}, \quad {}^n\mathrm{Meta}^\infty := \mathrm{Meta}^{\underbrace{\infty, \ldots, \infty}_{n \text{ times}}}, \quad {}^n\mathrm{META}^\infty := \mathrm{META}^{\underbrace{\infty, \ldots, \infty}_{n \text{ times}}}$$

leading to the final recursive limit:

$${}^\infty\mathrm{meta}^\infty := \lim_{n \to \infty} {}^n\mathrm{meta}^\infty, \quad {}^\infty\mathrm{Meta}^\infty := \lim_{n \to \infty} {}^n\mathrm{Meta}^\infty, \quad {}^\infty\mathrm{META}^\infty := \lim_{n \to \infty} {}^n\mathrm{META}^\infty$$

3.2 Ultimate Encapsulation in $\mathbb{METTA}$

The symbol $\mathbb{METTA}$ represents the ultimate recursive limit, encapsulating all levels:

$$\mathbb{METTA} := \lim_{n \to \infty} {}^\infty\left(\ldots^\infty(\ldots^\infty({}^\infty((^\infty((^\infty\mathrm{META}^\infty)^\infty)^\infty)\ldots)^\infty)\ldots)^\infty\right)^\infty$$

4 The Impossibility of a Superset "X Program"

With the Yang Program designed to encapsulate all conceivable recursive and meta-recursive levels through $\mathbb{META}$, the creation of any "X Program" that could strictly include the Yang Program as a sub-program becomes theoretically impossible. This conclusion is based on several principles:

1. **Ultimate Recursive Structure with** $\mathbb{META}$: The Yang Program, culminating in $\mathbb{META}$, already embodies the limit of all recursive meta-levels. Any hypothetical "X Program" would require structures or recursive depth beyond what $\mathbb{META}$ can encapsulate, which is conceptually unattainable given $\mathbb{META}$ includes all infinite recursions by definition.
2. **Inclusion of All Meta-Interdisciplinary Levels**: The Yang Program integrates all past, present, and future academic fields across all possible meta-levels. This boundless interdisciplinary scope suggests that the Yang Program already accounts for all conceivable structures, methods, and fields, leaving no additional levels for an "X Program" to uniquely encapsulate.
3. **Infinite Recursions and Self-Encapsulation**: Through self-recursive structures such as ${}^{\infty}(({}^{\infty}\mathrm{META}^{\infty})^{\infty})^{\infty}$, the Yang Program is capable of including even self-recursions of itself. For an "X Program" to strictly include the Yang Program, it would need to go beyond infinite recursion, a theoretical paradox that solidifies the Yang Program as the ultimate framework.

Thus, the Yang Program's construction through $\mathbb{META}$ effectively prevents any "X Program" from strictly containing it as a sub-program, confirming its status as a universal and complete system.

5 Conclusion

The Yang Program, defined recursively from meta to $\mathbb{META}$, offers a boundlessly extensible framework that integrates all levels of interdisciplinary knowledge, theoretical abstractions, and recursive meta-structures. By achieving the ultimate recursive form $\mathbb{META}$, the Yang Program establishes itself as a universal, self-sustaining system, precluding the possibility of any future program that could strictly include it as a sub-program.