

Computational Boomerangs: Non-Returnability of AI Models [for Logic, Language and Computation]

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20 November 2024



- 1 AI Convergence
- 2 Why Metaphysics?
- 3 Plato on Images
- 4 Computational Boomerangs
- 5 Non-Returnability

Understanding AI Convergence

- 1 **Convergence** — Philosophy of Science, Representational Learning, Anna Karenina Scenario, Happy Representations
- 2 “The training data for our algorithms are shadows on the cave wall, yet, we hypothesize, models are recovering ever better representations of the actual world outside the cave.” (Huh et al., 2024, 2)¹
- 3 **Limitation of PRH:** Different sensors and views might capture different information, which may limit their potential to converge to identical representations. (*Anekāntavāda*)

¹Huh, M., Cheung, B., Wang, T., Isola, P. (2024). The Platonic representation hypothesis. arXiv. <https://doi.org/10.48550/arXiv.2405.07987>

The Platonic Representation Hypothesis (PRH)

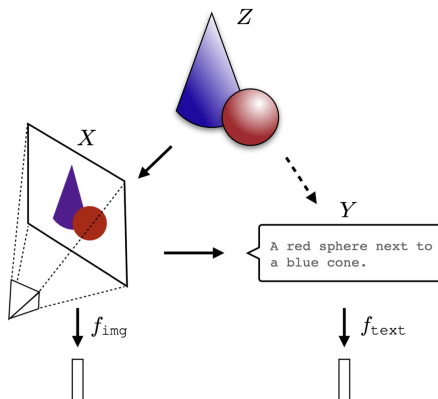
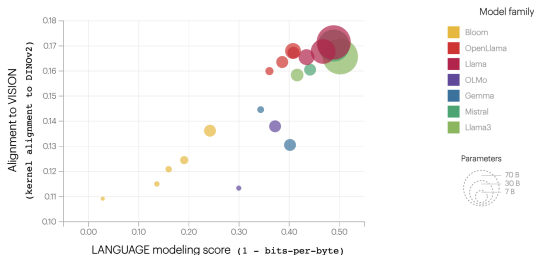


Figure: The Platonic Representation Hypothesis (PRH): Images (X) and text (Y) are projections of a common underlying reality (Z). We conjecture that representation learning algorithms will converge on a shared representation of Z , and scaling model size, as well as data and task diversity, drives this convergence.

Kernel Alignment Metric (PRH)



We demonstrate convergence across data modalities: as vision models and language models get larger, they measure distance between datapoints in a more and more alike way.

$$\text{sim}(f_{\text{text}}(\text{"apple"}), f_{\text{text}}(\text{"orange"})) \approx \text{sim}(f_{\text{img}}(\text{apple}), f_{\text{img}}(\text{orange}))$$

Hypospace: click

Why Metaphysics? A metaphilosophical question

- 1 There is a drive in some areas of sciences and philosophy to come upon metaphysics as a scientific discovery or a scientific discovery as a metaphysics.
- 2 The scientific Use and Misuse of Philosophy
 - 1 Metaphilosophical issues of Cherry-Picking
 - 2 Development of probabilism in philosophy ignored
- 3 Main question - Does PRH stand with Plato's metaphysics?

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METAPHILOSOPHY
Vol. 48, No. 4, July 2017
0026-1068

THE PHILOSOPHICAL USE AND MISUSE OF SCIENCE

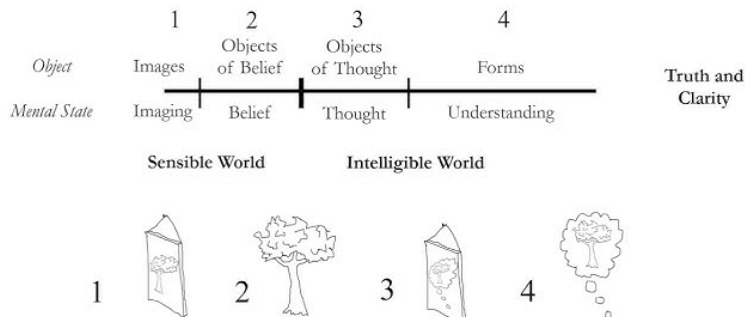
JUSTINE KINGSBURY AND TIM DARE

Figure: A Scientific Use and Misuse of Philosophy?

Why Metaphysics? A metaphilosophical question

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The Divided Line



- 1 Model (*paradeigma*) is still an Image (*eikon*), both opinion (*doxa*)
- 2 To become a model, it has to be rid of a posteriori content exponentially
- 3 Plato's mixture of quantitative and qualitative can be deceitful

Plato's Image-Model Agnosticism

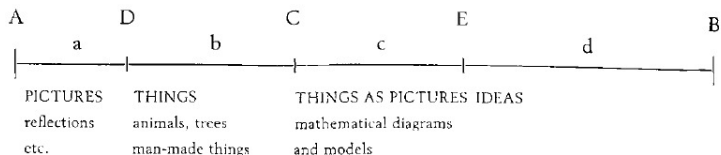
- 1 Samuel Meister observes that "...the main achievement of the *Timaeus* is arguably its account of the sensible world, and on that account, the ontology of images plays a central role: **Sensible entities from the elements up to the world as a whole are all characterized as images.**"²
- 2 According to E.E. Pender, "For Plato, a model (*paradeigma*) is like an image (*eikon*) in that it involves comparing two different domains. Plato identifies models as a **developed form of language use, which is needed to illustrate difficult subjects.**"³
- 3 Does the kernel approach affine with Plato's Image-Model agnosticism?

$$\hat{f}(x) = \frac{1}{n} \sum_{i=1}^n K\left(\frac{x - x_i}{h}\right)$$

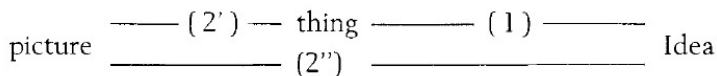
²The Ontology of Images in Plato's *Timaeus* [British Journal for the History of Philosophy 30: 909-30 (2022)]

³Plato on Metaphors and Models, pg. 72 (2003)

Extensions of the Line



- ① a/b , c/d , $a+b/c+d$ express relation of truth and reality in degrees



- ① 1 - objects of our experience as *pictures* of the Ideas
- ② 2' - picture of the thing and the name of the thing, eg. 'bed'
- ③ 2'' - picture of the thing and idea of the thing

- 1 PRH has no hypothesis, it is a speculation. Models do not converge over reality but can help to reason and become wiser and wiser.
- 2 Acknowledgement of modality-agnosticism in Plato, but not realising its true scope being global for cognition-as-such and not merely a sensory modality.
- 3 PRH is taking an apodictic approach⁴, a path of demonstration which necessarily demands a returning topology and cannot be a hypothesis either.
- 4 Platonic forms are timeless

$$\hat{f}(x) = \frac{1}{n} \sum_{i=1}^n K \left(\frac{x - x_i}{h} \right)$$

⁴Apodictic evidence for ideal Platonic laws

A heretic formalisation

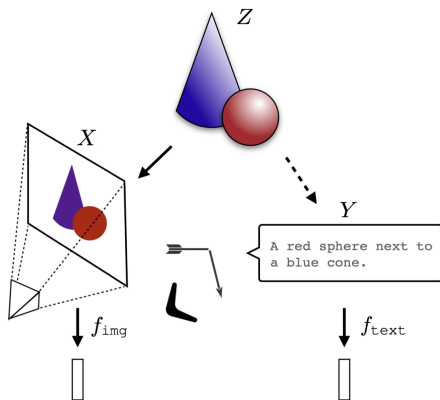


Figure: The model relies on a symmetry between image and text. I am going to argue that the image holds a kernel, like text, its own pulsion and phenomenological horizon opening it toward a radical imaginary, always equipped with $\sqrt{-1}$.

Wait a minute!

- Statistical probabilism and Platonic forms?



Figure: Jan von Plato, *Creating Modern Probability*

Hume and Kant (for Peter Lukan) exemplify the impact of statistical probabilism over metaphysics, specifically Kant.

Hume and Kant: Probability and Dualities of Experience

Hume and Probability	Kant and Probability
<ul style="list-style-type: none">① Hume: "...all knowledge degenerates into probability." ⁵② Non-Thomist Philosophy — <i>epistēmē</i> as demonstrative proof, <i>doxa</i> as mere opinion③ Demonstration only applicable to mathematics, every other data is probabilistic. ⁶④ Hume: "...And must cultivate true metaphysics with some care, in order to destroy the false and adulterate."	<ul style="list-style-type: none">① A systematic ordering, ordered by rational principles, principles that are <i>a priori</i> and are apodictic (demonstrative) in nature but also sensible.② Knowledge at the verge of an explosion, not of data but model, requiring a "consciousness of their necessity"⁷③ Kant has talked of 'original germs' and 'vermins' with regards to the structure of ideas in the Architectonics of Pure Reason in <i>Critique</i>.

⁵ A Treatise of Human Nature, Book 1, Part 4, Section 1, T 1.4.1.1, SBN 180

⁶ Lukan calls it "evidential impact".

⁷ Kant, *Metaphysical Foundations of Natural Science* (1786)

How probabilism morphed *Idea*

Philosopher	idea[IMG]
Hume	bundle
Kant	cognitive manifold
Hegel	notion-objectivity unity
Nietzsche	anti-Platonic, will-oriented
Husserl	sheaf [phenomenological Platonism]
Derrida	traces
Benjamin/Adorno	constellation
Deleuze	rhizomatic
Laruelle	data-for-human

Table: Impact of probabilism on the notion of Ideas



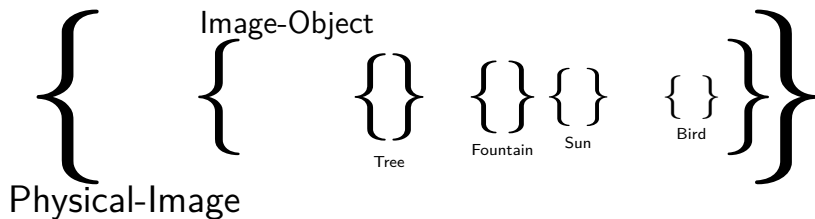
Figure: Upper Lake, Bhopal, Madhya Pradesh

Image-Subject and its anisotropy



Figure: Upper Lake, Bhopal, Madhya Pradesh

Non-Bijectionality of Image-Subject



Int. J. Human-Computer Studies (1995) **00**, 741-763

Sheaf mereology and Husserl's morphological ontology

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Petitot finds that the ontological design of both Husserlian phenomenology and object-oriented epistemology is similar and extends it to geometrical concepts of fibration, sheaf and topos.

- We can see in Husserl's "eidetic reduction" the innovative method of bracketing or object segmentation. [DINO: click]

Computational Boomerang (Returning)

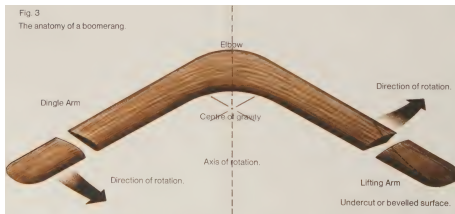


Figure: Boomerang components: Elbow, Dingle Arm, Lifting Arm, Leading Edge, and Trailing Edge, along with the Center of Gravity, Axis of Rotation, and the Direction of Rotation

I am using the term computational boomerangs against the trend in AI (as seen in PRH) to return back to a metaphysical kernel in philosophy (a preliminary Bachelardian stance). My aim is to construct a theoretical non-returning boomerang which has an orientation of $\sqrt{-1}$.

Laruelle and Non-Photography

“In reality, photography, far from analyzing the World (something it also does, but only as a secondary effect) to draw out an image from it, or synthesizing images – always on the basis of the World—with forces or with computers—replaces itself from the start in this hyper-perceptual and hyper-imaginary dimension that it effectuates or actualizes with the aid of the representational support – including its technological conditions of existence.” (Laruelle, *The Concept of Non-Photography*, 118)

- 1 NP gives a chance of thinking in a non-apodictic manner by recognizing a non-bijective potential in images.
- 2 Images hold an in-between dimension, its own being-in-image and its basis in the World, making their truth-value secondary and affective value prominent.
- 3 Axioms that are not true but **real**. Transcendental axioms instead of logical axioms.

Laruelle and Non-Returnability

- 1 One of the most scathing critiques of PRH would come from a vindication of vectors and at the same time an insurrection of vectors in this model based on vector embeddings.
- 2 Laruelle talks of two realisms in terms of photographs.
Realism 1: *philosophical in-itself*, an identity.
Realism 2: *photo-fiction*, a algebraic function applied over the variables of the photo.
- 3 Identity representation:

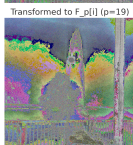
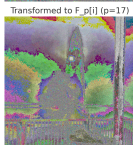
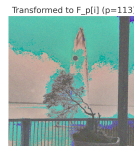
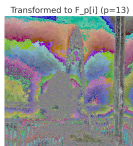
Proof:

$$\forall x, \quad f(x) = \frac{1}{x}, \quad f(x)^{-1} = x \quad \text{only if} \quad x = \pm 1$$
$$x^{-1} = x \Rightarrow x \cdot x = 1 \Rightarrow x^2 = 1 \Rightarrow x = \pm 1$$

Transformation in the Finite Field $F_p[i]$

$$C = (R_{modp}) + i \cdot (R_{imagmodp}) \quad (1)$$

- C represents the color channel value,
- R_{modp} is the modular reduction of the color channel,
- $R_{imagmodp}$ is the random imaginary component, and
- i is the imaginary unit.



- 1 Extending on the algebraic identity of the image to an abstract algebraic field as a non-Platonic gesture of ‘copy + abstraction’
- 2 I have utilized the finite field $\mathbb{Z}/p\mathbb{Z}$ (denoted as \mathbb{F}_p), which provides the framework for modular arithmetic. By incorporating the extension $\mathbb{F}_p[i]$, where $i^2 = -1$, this approach introduces dimensional complexity that reflects the surplus inherent in the image.
- 3 Non-bijective relation on image-subject, “being-in-image” or the Sun of the Image and not the World.
- 4 crypto-photography, delinking images and text
- 5 The convergence of AI models are not going to be smooth as they are not free of cost. **Beware of messianic pipe dreams (Isaac Levi)**

Thank you!
Questions?