The Anthropocentrism of Intelligence: Rooted Assumptions that Hinder the Study of General Intelligence

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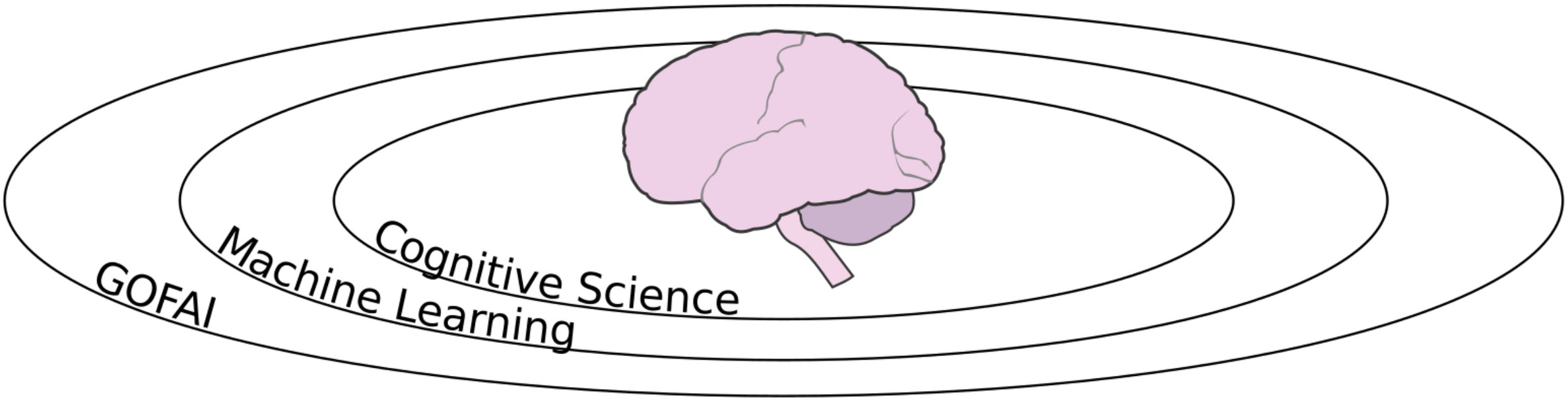
Introduction

- ✓ AGI is around 20 years away.
- ✓ Useful AI is constrained to *narrow* AI
- ✓ Some philosophical questions:
  - What is intelligence?
  - Are there limits to intelligence?
  - What are the core mechanisms of intelligence?
  - What are the building blocks of intelligence?

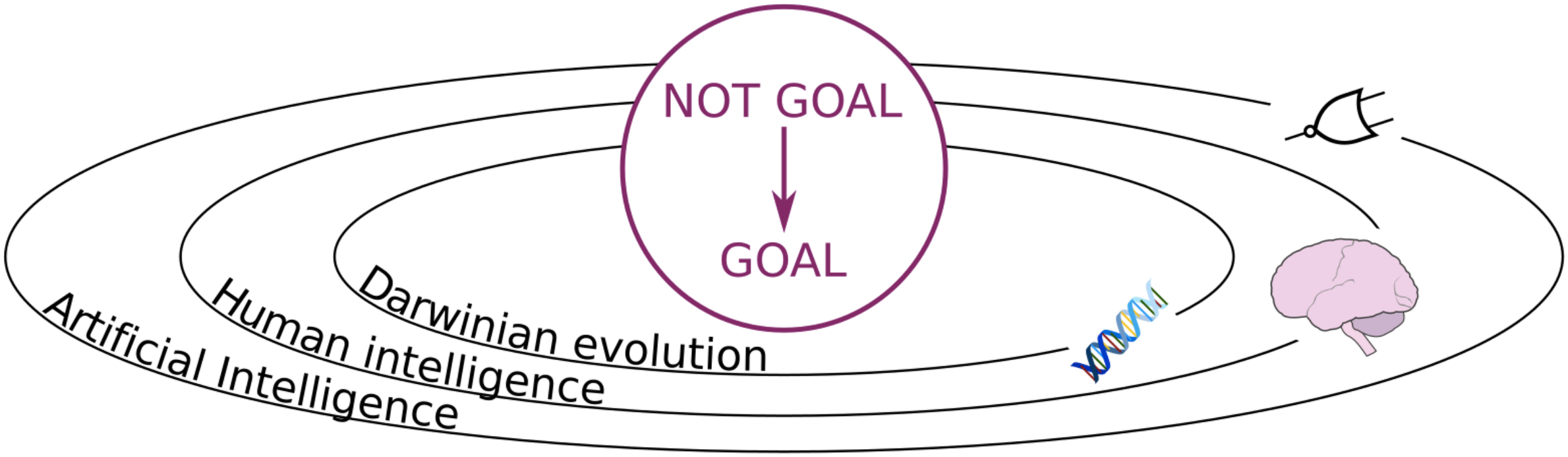
- ➡ Our philosophical view of General Intelligence.
  - Abstraction and generalization, as much as possible.

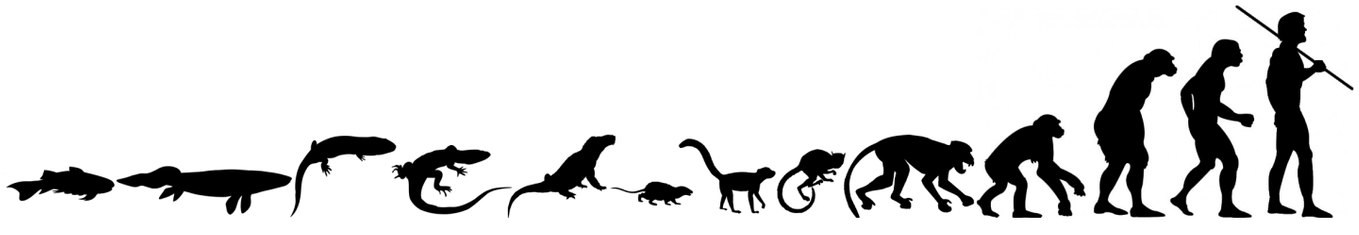
“Ptolemaic” Model Of Intelligence



- ✓ What we want / expect General Intelligence to be
- ✓ Pros and Cons of human intelligence

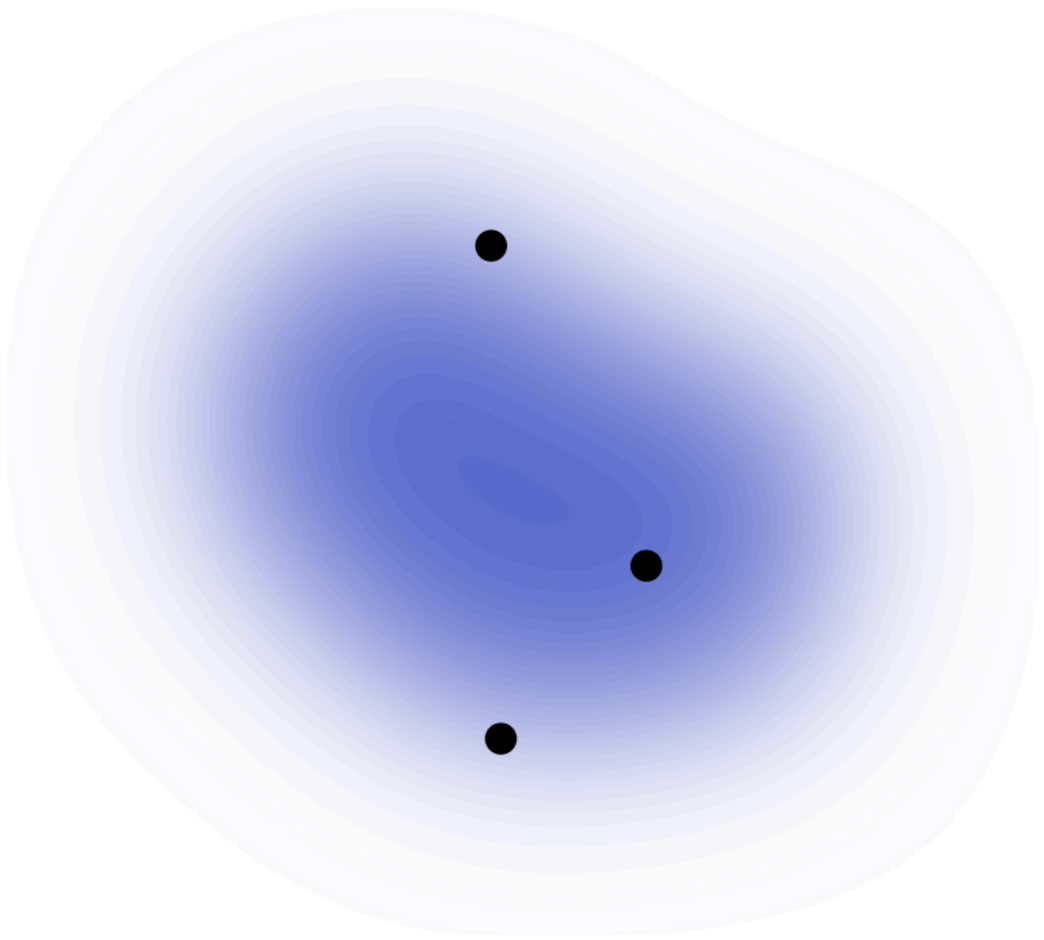
“Copernican” Model Of Intelligence





- ✓ Human ingenuity
- ✓ Evolution

Intelligence Cannot Be Defined



- ✓ No standard definition: Application-specific definitions
- ✓ Collapse of the generality of intelligence if defined
- ✓ Subjective
- ✓ General Intelligence: *Fulfilment of goals*

Cognitive Efficiency Does Not Matter

A. Benchmarking

- Goal: Solve a problem
- Goal: Solve a problem as fast as possible
- Goal: Solve a problem faster than others

B. Resource conservation and mistake avoidance

- Only when the number of attempts is limited

➡ Attaining goals faster does not imply getting closer to GI.

➡ Neither does avoiding mistakes, in the general case.

Evolution Is Intelligent

- ✓ Free will in… evolution?
  - Two stage models in human free will:
    1. Conceive alternative futures ~ Chance
    2. Select between them ~ Choice
  - Same mechanisms in Darwinian evolution:
    1. Mutations in DNA replication
    2. Natural selection
  - Links between creativity and two stage models, *e.g.* Brainstorming
- ✓ Reinterpreting evolution: Neglected evidence of intelligence
  - Argument from design, genetic algorithms
  - Simple realization of General Intelligence

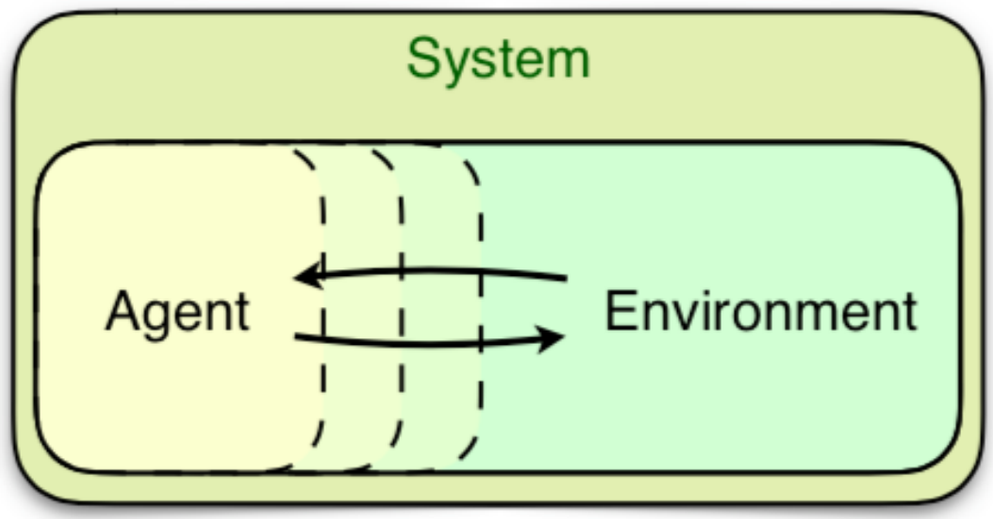
Representations In GI Are Redundant

- ✓ Representations are thoroughly used in human intelligence.
- ✓ Planning, reasoning, etc. improve efficiency and resource usage
  - One-attempt goals, extrapolation
- ✓ But indecomposable problems are problematic.
  - Complex systems, chaotic systems
- ✓ But Are representations really required for GI?
- ✓ Darwinian evolution does not use representations.

➡ A general theory must allow representations but not require them.

Agents Are Redundant

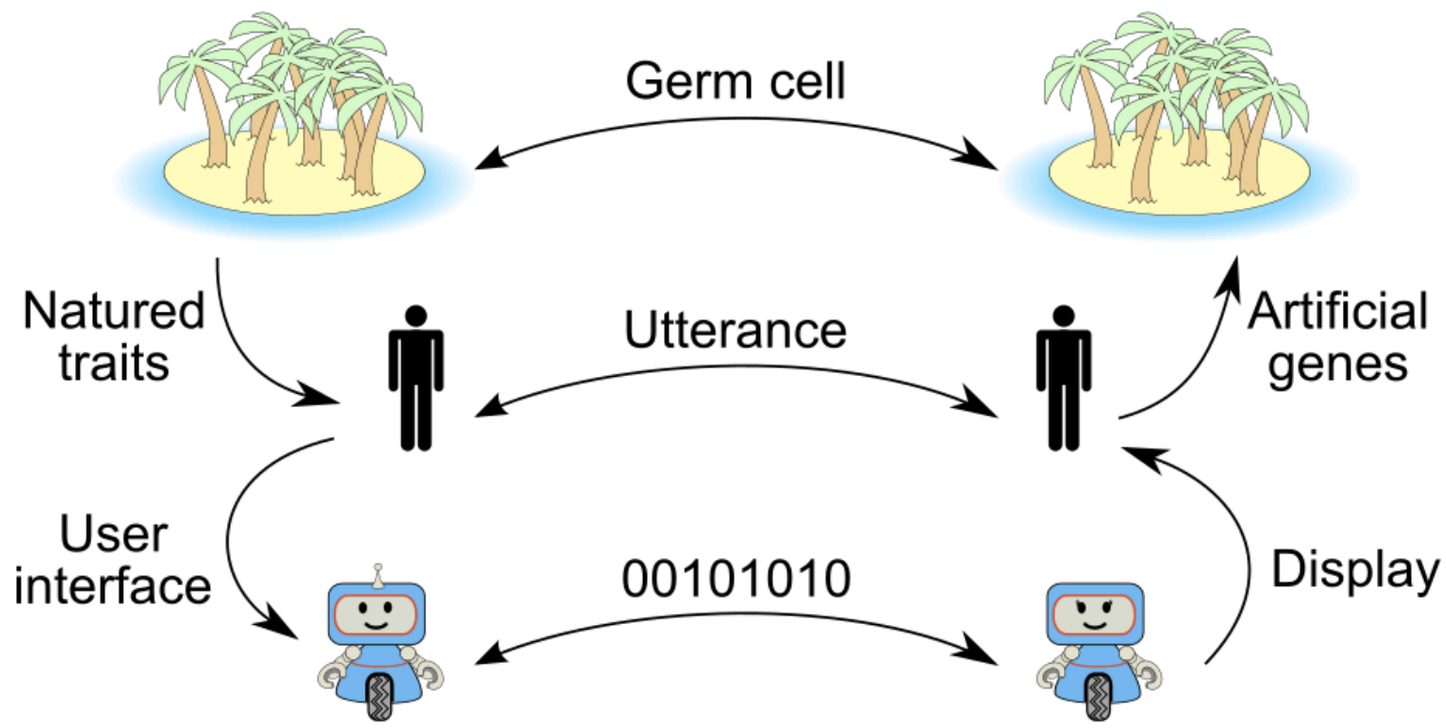
- Natural way to deal with the environment
- Boundaries are artificially set
- Not always possible
  - Multi-agents
  - Polymorphic robots



- We should regard agent and environment as an indivisible unit.

Language Is Redundant

- Natural language is crucial in social contexts.
- Enables collaboration by sharing representations.
- Other forms of communication are possible without representations:



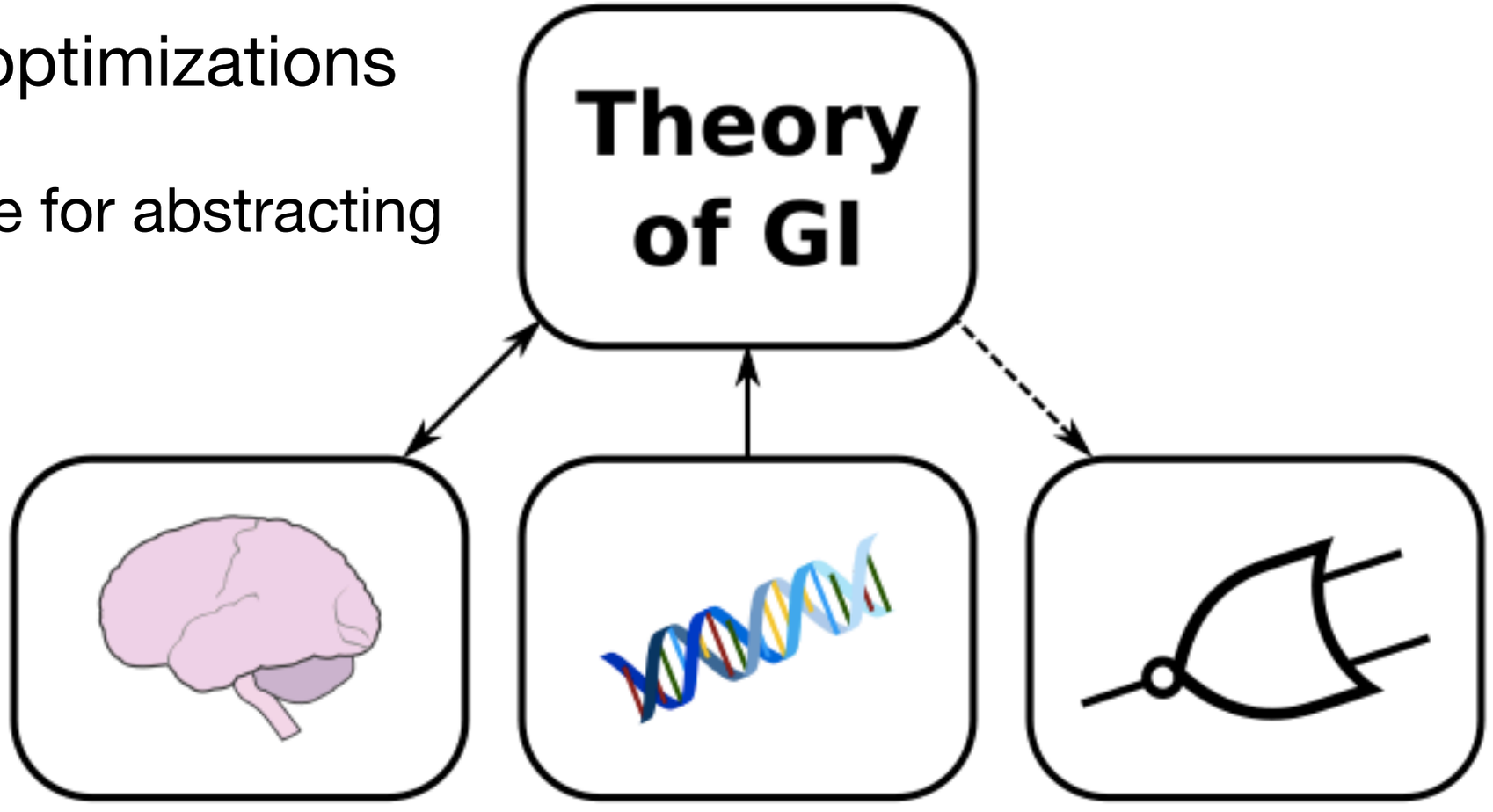
- Is natural language really necessary for General Intelligence?

The Road Ahead

- From: Human intelligence plays a central role in GI.
  To: Human intelligence is a realization of GI with pros and cons.

- Human intelligence might be a too complex realization of GI.
  - Diverting efforts to inessential features

- Evolution as a realization of GI
  stripped of fancy optimizations
  - Use this knowledge for abstracting a theory of GI.



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Thank you for your attention.

ご清聴ありがとうございました