

114-05-D Are You Inside the Rubik's Cube?

A Lesson from IIT Bombay About Frames of Reference

A Question That Refused to Go Away

Today's AI world and the concerns that Frontier lab insiders express (self-amplifying Skynet type fears) remind me of an incident 45 years ago. In 1982, during my years at IIT Bombay, the inventor of the Rubik's Cube, Ernő Rubik, visited the institute for a meet-and-greet session.

Students naturally asked questions about the puzzle.

- How difficult was it to invent?
- How many possible combinations existed?
- How should one solve it?

Then one of my seniors, Girish Patharphod, asked a question that left the entire audience bewildered. He asked:

"We solve the Rubik's Cube from outside the cube. Our definition of Euclidean space is therefore external. But what if we were inside the cube? Does the geometry change?"

Most of us thought he had asked the strangest question imaginable. I do not even remember Ernő Rubik's reply. But I have remembered the question for more than four decades.

Today, I think I finally understand why.

It Was Never About the Cube

- The question was never really about geometry.
- It was about frame of reference.
- Change the observer, and the system itself appears different.
- The object has not changed. Only the viewpoint has.
- Yet that change in perspective completely changes the questions one can ask.

Inside the Cube

Imagine living inside one small cube of the Rubik's Cube.

Your world consists of:

- your own faces,
- your neighboring cubes,
- your own rotations.

Your natural questions become:

- How do I orient myself?
- How do I optimize my position?
- How do I move more efficiently?

Everything you observe is local.

Outside the Cube

Now step outside. Suddenly you see something the individual cube never could.

You observe:

- the complete structure,
- every interaction,

- every rotation,
- every dependency,
- the overall pattern.

You stop asking:

"How does this cube move?"

You begin asking:

"How does the entire cube behave?"

Frontier AI Lives Inside the Cube

Much of today's frontier AI research naturally studies the cognitive engine itself.

The questions become:

- How do we improve reasoning?
- How do we scale intelligence?
- How do we train better models?
- How do we achieve recursive self-improvement?

These are entirely legitimate questions.

They are questions from inside the cube. The cognitive engine is the object of study.

GUDIYA Lives Outside the Cube

GUDIYA asks a completely different class of questions.

Not:

"How intelligent is this Agent?"

But:

- How are millions of Agents interacting?
- Where is synchronization failing?
- Which perturbations are propagating?
- Which enterprises are exhausting Stability Budget?
- Where is Cognitive Ballast required?
- How is equilibrium changing across the entire Grid?

These questions cannot be answered from within any single cognitive engine. They require an ecosystem perspective.

The Geometry Changes

This is the profound lesson my senior's question hinted at.

- Move the observer.
- Change the geometry.
- The same system now reveals different truths.
- Inside the cube, local optimization dominates.
- Outside the cube, global equilibrium dominates.
- Neither perspective is wrong.
- But each reveals phenomena invisible to the other.

Why GUDIYA Must Be External

This also explains one of GUDIYA's most important architectural principles.

The Grid should not reside inside any individual frontier model.

- Not because frontier models lack intelligence.
- But because they occupy a different observational frame.
- A participant inside the system naturally optimizes its own cognition.
- A Grid external to the participants can optimize the stability of the ecosystem they collectively create.
- This distinction is architectural, not competitive.

History Repeats This Pattern

Many engineering disciplines eventually separate into two perspectives.

The engine.

The computer.

The aircraft.

The power plant.

Likewise, Artificial Intelligence studies cognition.

And the transportation network.

And the Internet.

And Air Traffic Control.

And the electrical grid.

GUDIYA studies the ecosystem within which cognition lives.

Two Different Questions

The frontier laboratory asks:

"How do we make cognition more powerful?"

GUDIYA asks:

"How do we ensure increasingly powerful cognition can coexist, cooperate, and accelerate civilization without destabilizing it?"

- The questions are complementary.
- One creates capability.
- The other preserves equilibrium.

A New Architectural Principle

Perhaps one day Stability Engineers will begin every major AI discussion by asking a deceptively simple question:

"Are we reasoning from inside the Rubik's Cube—or outside it?"

Because many engineering problems disappear—or suddenly become visible—the moment we change our frame of reference.

Final Thought

Forty-four years ago, a seemingly eccentric question echoed through a lecture hall at IIT Bombay.

Most of us dismissed it.

Today, it feels remarkably prophetic.

- The future of Artificial Intelligence may not be determined solely by what happens inside the world's most capable cognitive engines.
- It may equally depend upon what we can finally see once we step outside the cube.
- Artificial Intelligence optimizes cognition from within.
- GUDIYA optimizes equilibrium from without.

Sometimes, the greatest breakthrough comes not from building a better cube—but from changing where we stand to observe it.

ARE YOU INSIDE THE RUBIK'S CUBE?

The Same System. Different Perspective. Different Questions.

INSIDE THE CUBE

The View from Within

Focused on the engine of intelligence. The questions are local.

- How do I reason better?
- How do I learn faster?
- How do I scale intelligence?
- How do I improve myself?
- How do I recursively optimize?



NICK BOSTROM

Thinking about
superintelligence



DARIO AMODEI

Building more
powerful models



ELON MUSK

Pushing the
frontiers of AI

"We solve the Rubik's Cube from outside the cube. Our definition of Euclidean space is therefore external. But what if we were inside the cube? Does the geometry change?"

– Girish Patharphod
IIT Bombay, 1982

INSIDE: OPTIMIZE INTELLIGENCE
OUTSIDE: OPTIMIZE EQUILIBRIUM

Both are essential. But the perspective changes everything.

The world needs builders of intelligence.

It equally needs guardians of equilibrium.

GUDIYA works outside the cube, so intelligence can thrive inside it.

OUTSIDE THE CUBE

The View from Outside

Focused on the ecosystem of intelligence. The questions are global.

- How are millions of AIs interacting?
- Where is synchronization breaking?
- Which perturbations are propagating?
- Who is exhausting Stability Budget?
- Where is equilibrium at risk?
- How do we keep the system stable?



**GUDIYA
GRID**