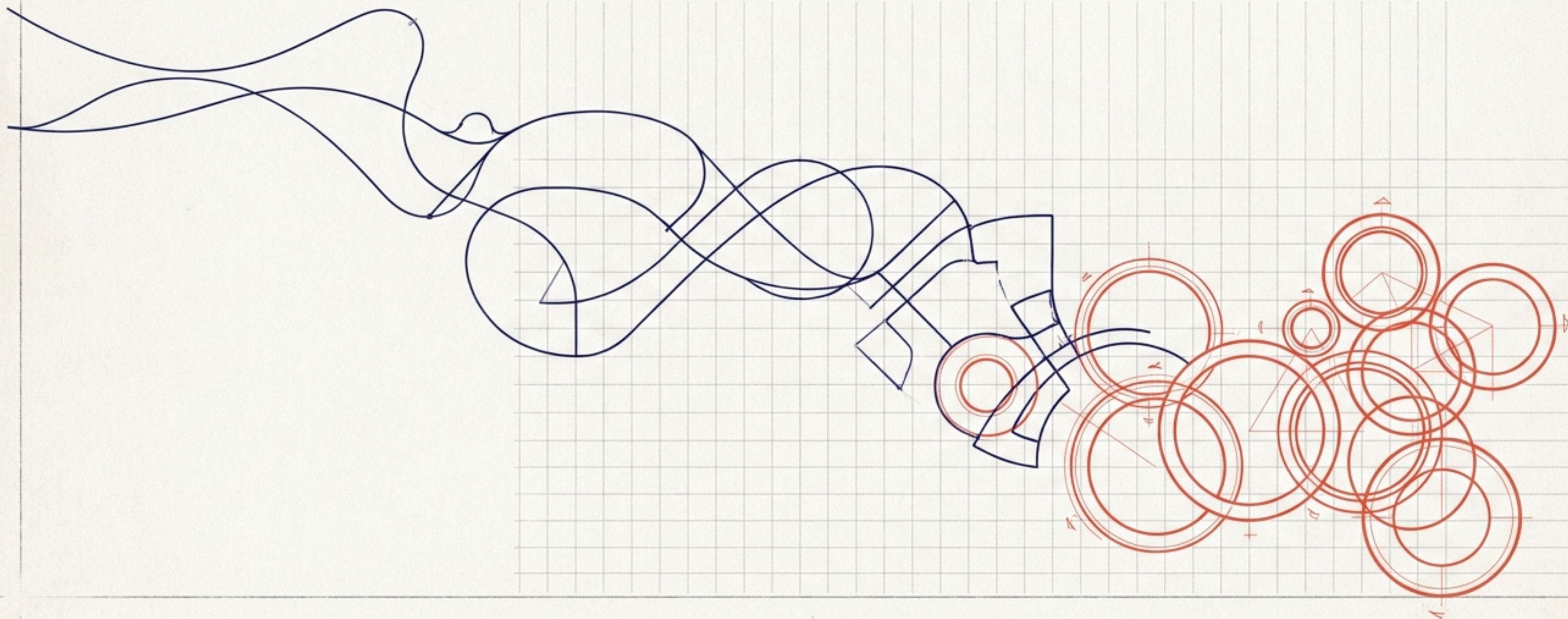


Programs as Histories

The Cartography of Possibility and the Spherepop Inversion

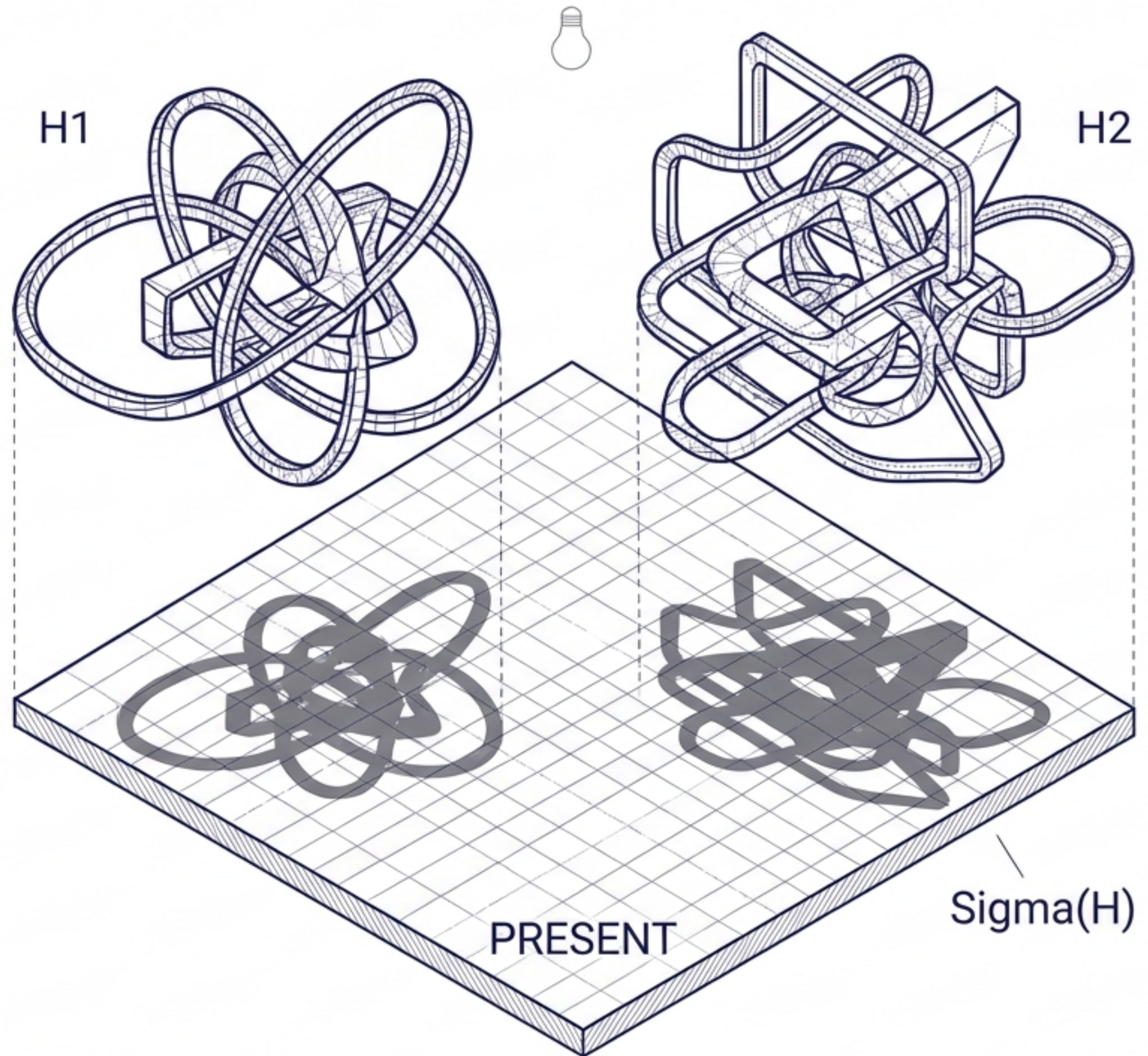
Computation is the progressive restriction of possibility, not the manipulation of values.



The State Illusion

State is the summary.
History is the substance.
The collapse is the
problem.

Any program that
exposes only the current
state to its user has
silently discarded
distinguishing
information about its
history. State is
degenerate.



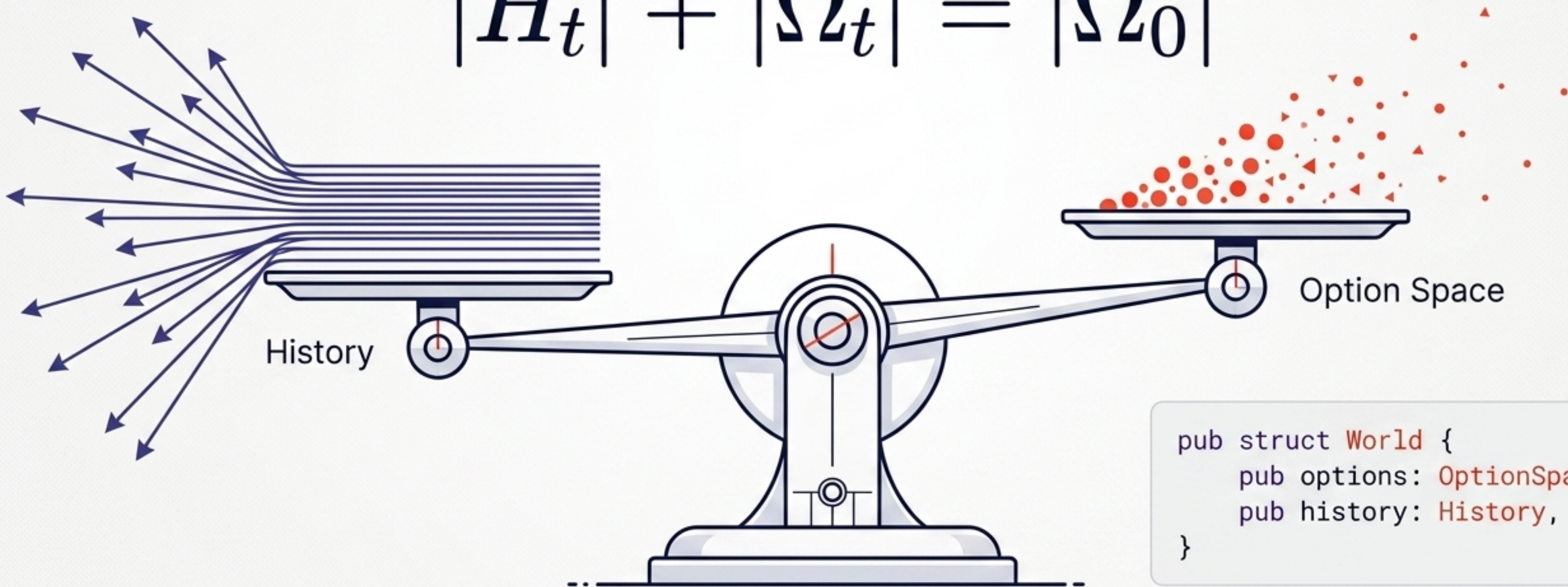
The Ontological Inversion Matrix

Primary Primitive:	Conventional: Current State	Spherepop: Constructed History
Computation Model:	Conventional: Value Manipulation	Spherepop: Possibility Restriction
Types:	Conventional: Sets of Valid Values	Spherepop: Certificates of Reachability
Functions:	Conventional: Fundamental Primitives	Spherepop: Deferred Historical Commitments
Bugs:	Conventional: Corrupted State	Spherepop: Inadmissible Commitments

The Conservation of Possibility

Possibility cannot be created or destroyed, only consumed or documented. The absence of a state field in the core architecture is the strict mechanization of this physical law.

$$|H_t| + |\Omega_t| = |\Omega_0|$$

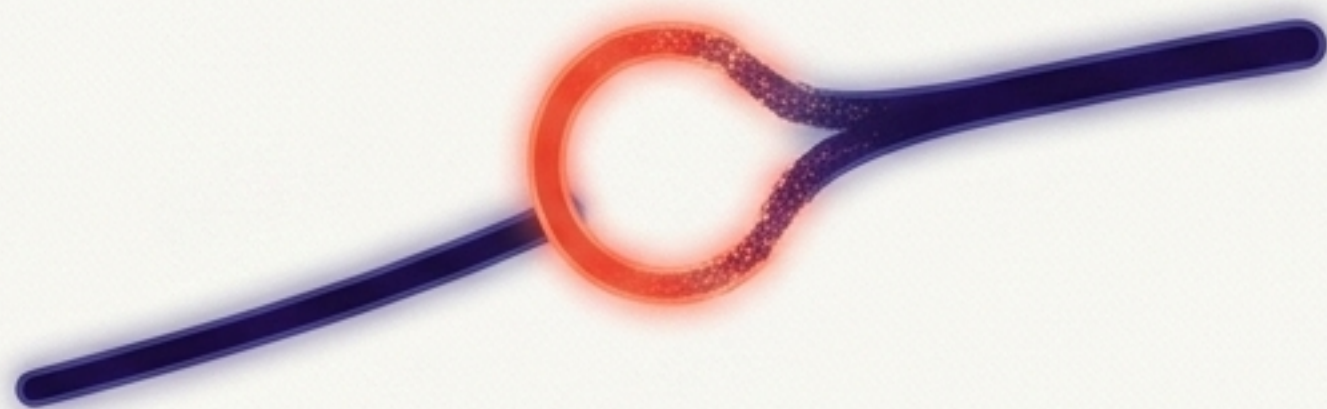


```
pub struct World {  
  pub options: OptionSpace,  
  pub history: History,  
}
```

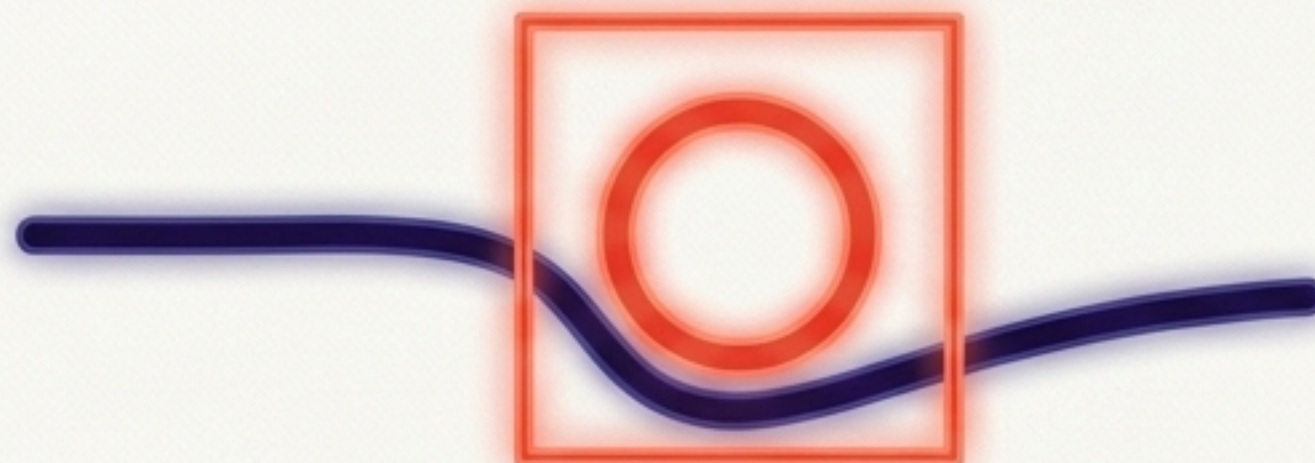
The Four Primitives

Every conventional language construct is just a sequence of these spatial deformations.

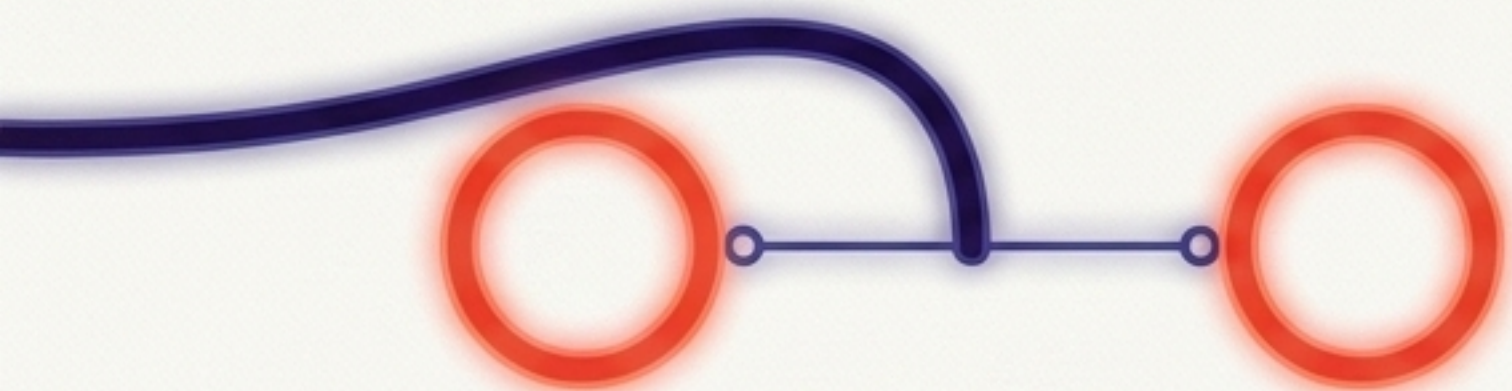
Pop (Commitment)



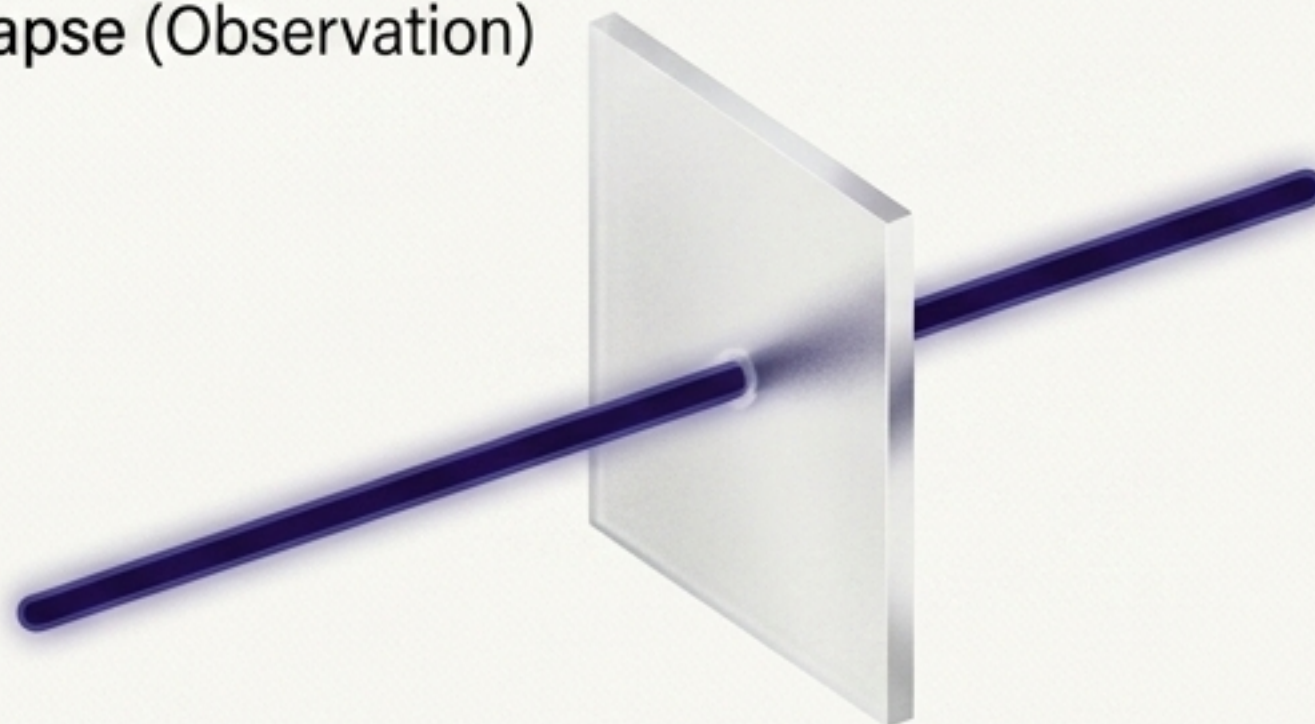
Refuse (Documented Inadmissibility)



Bind (Dependency)

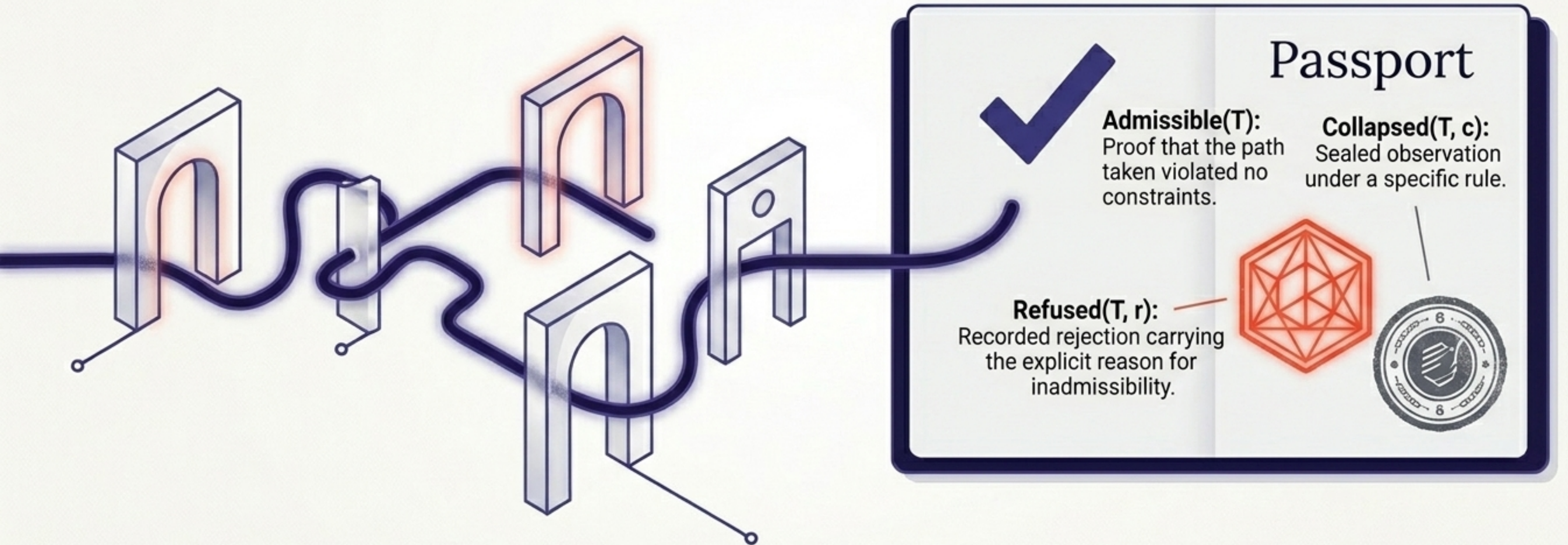


Collapse (Observation)



Types as Reachability Certificates

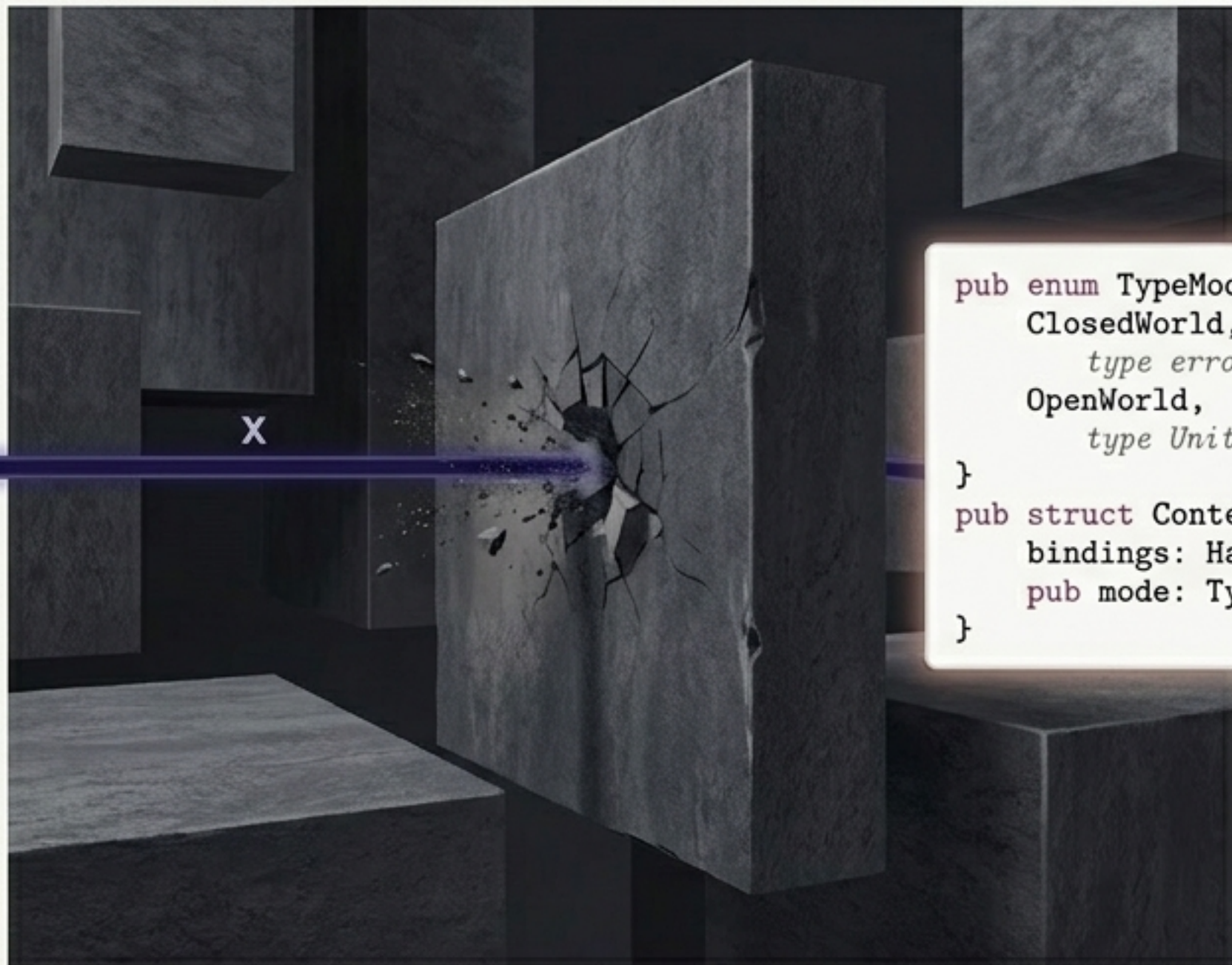
A term carries a certified record of the path taken and the alternatives refused.
Collapse is a hard type error without an Admissible passport.



The Epistemology of the Type Checker

Behavior depends not just on the code, but on the assumed boundary of the world.

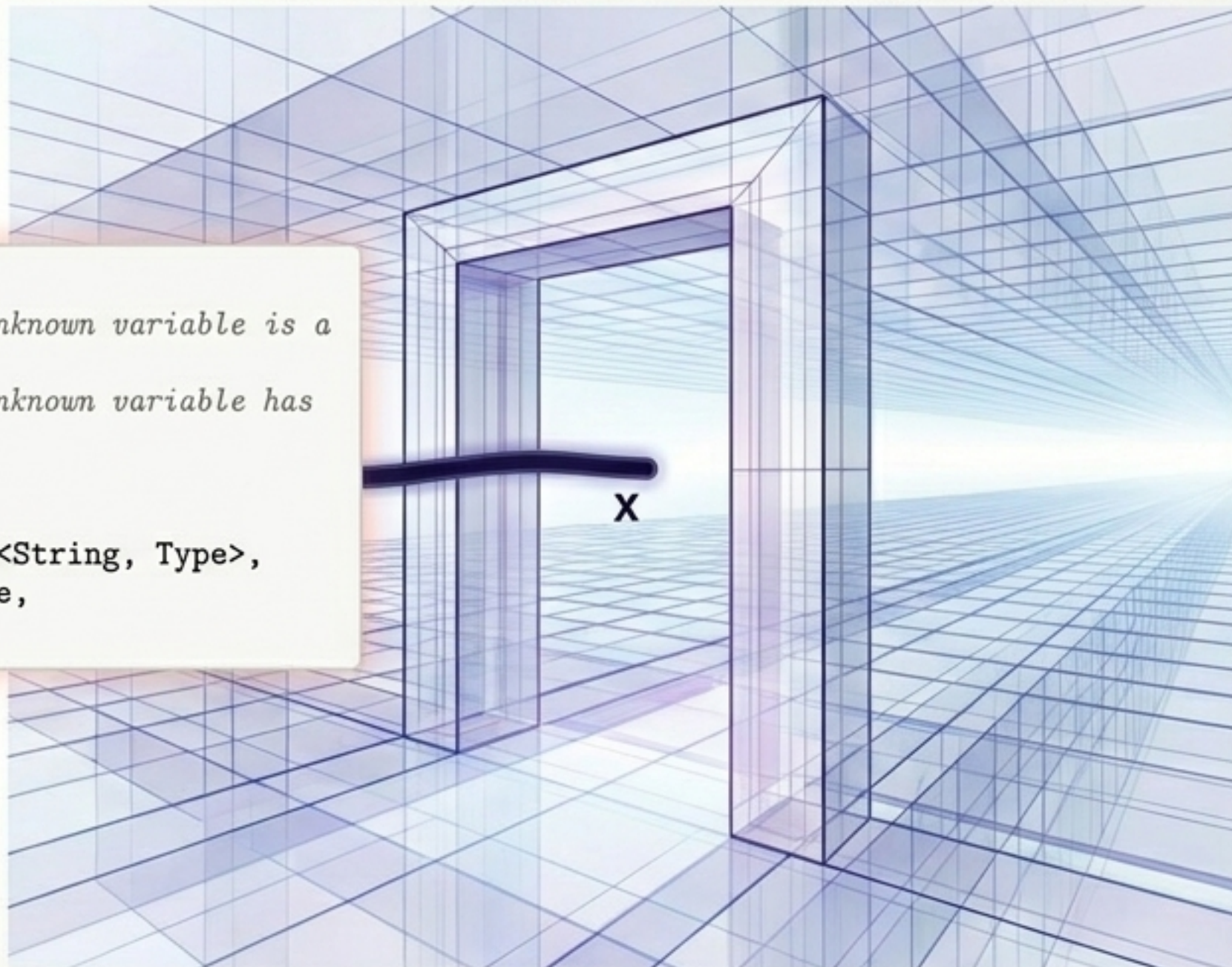
Closed World Context



```
pub enum TypeMode {  
  ClosedWorld, // unknown variable is a  
               // type error  
  OpenWorld,  // unknown variable has  
              // type Unit  
}  
pub struct Context {  
  bindings: HashMap<String, Type>,  
  pub mode: TypeMode,  
}
```

Absence of declaration = Absence of object. (Type Error)

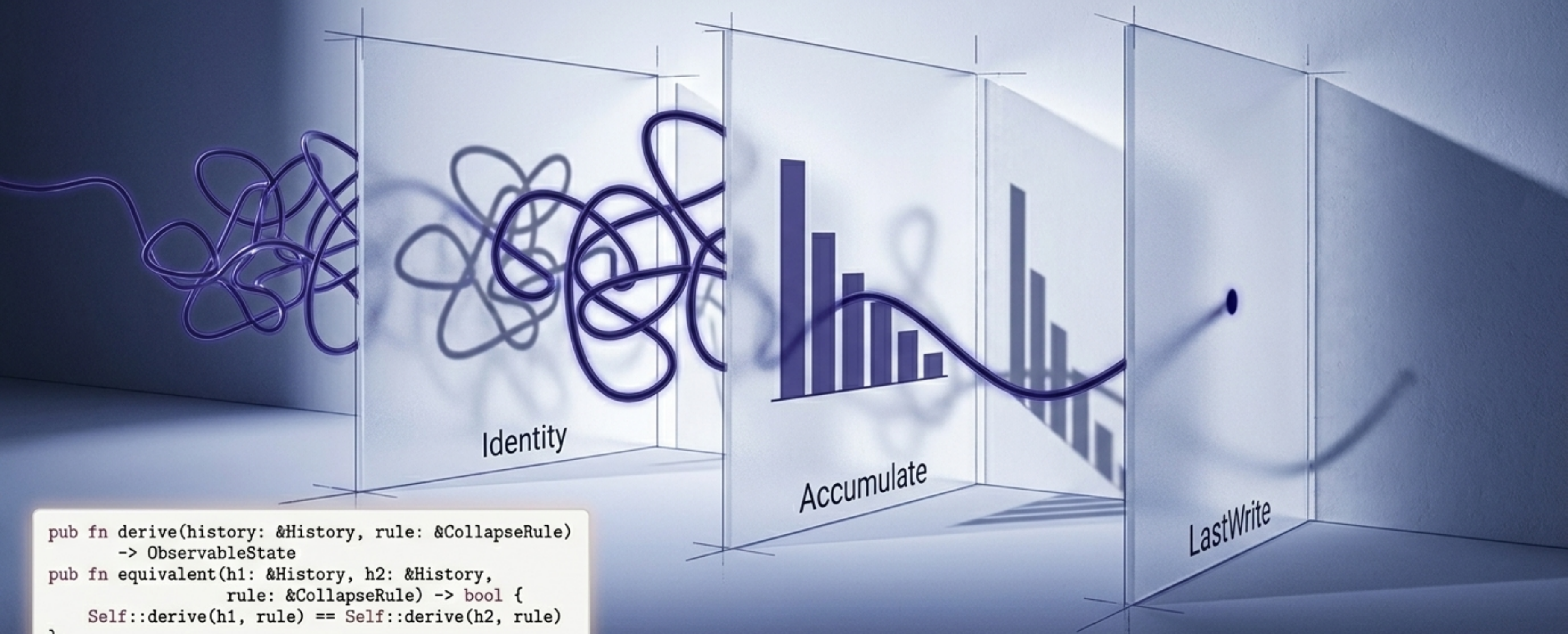
Open World Context



Absence of declaration = Undecided possibility. (Type Unit)

The Collapse Functor

Observable state is not a fundamental property; it is a quotient.
Changing the collapse rule changes the topology of what you can see.



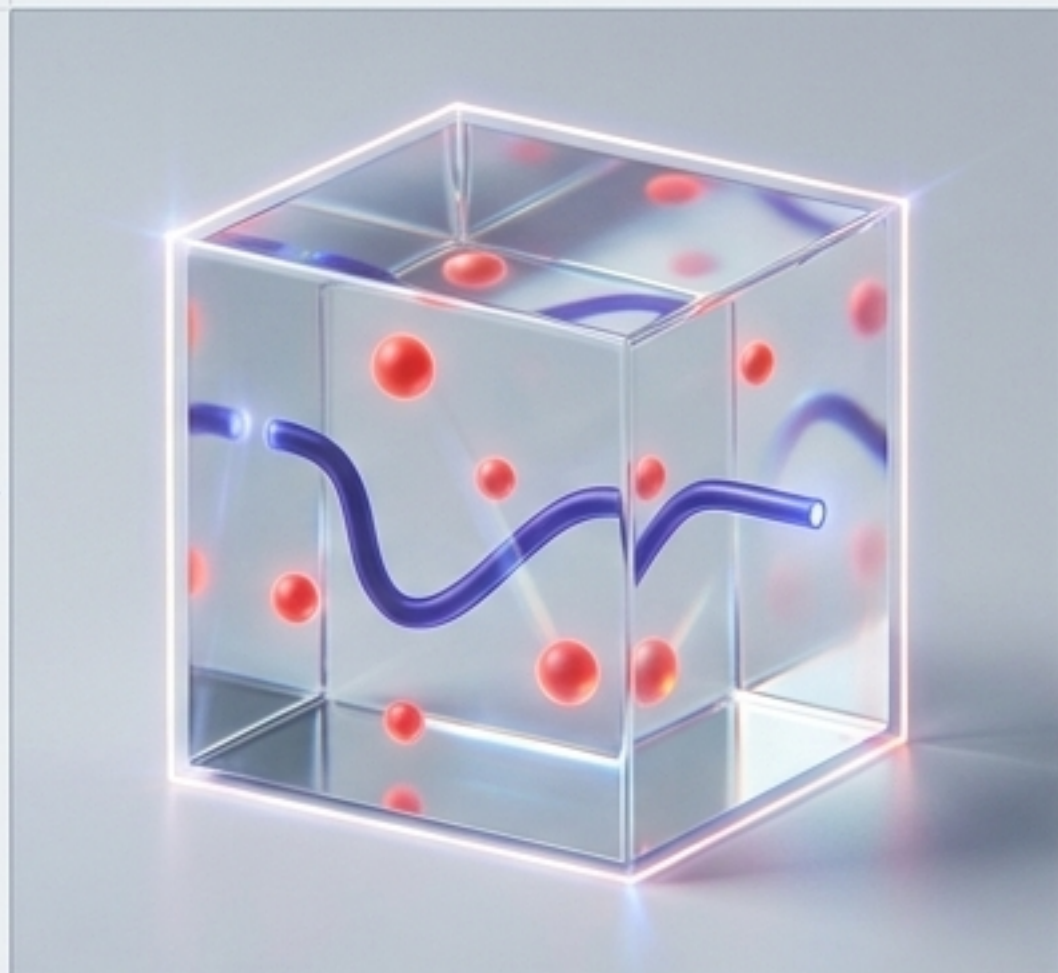
```
pub fn derive(history: &History, rule: &CollapseRule)
  -> ObservableState
pub fn equivalent(h1: &History, h2: &History,
  rule: &CollapseRule) -> bool {
  Self::derive(h1, rule) == Self::derive(h2, rule)
}
```

Closures as Frozen Possibilities

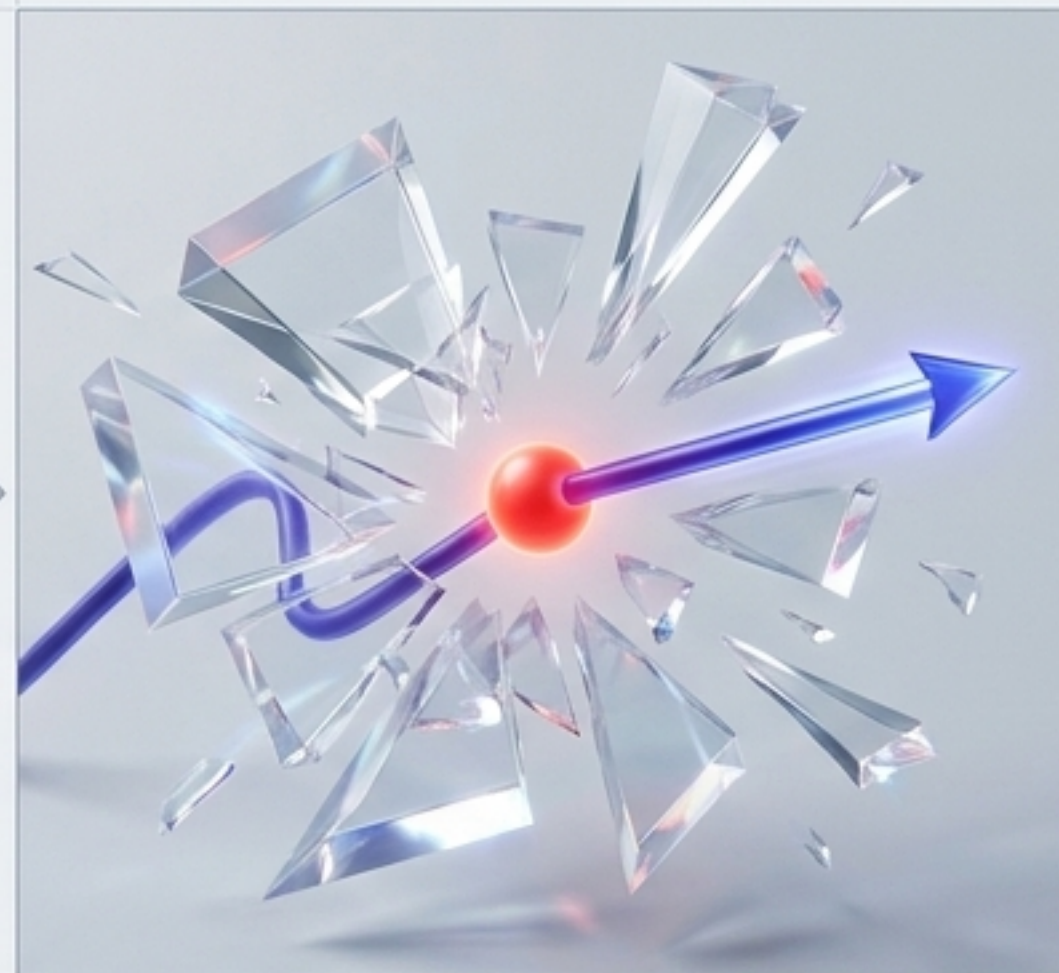
Functions are not primitive. They are merely deferred commitments—historical paths suspended in stasis until actualization.



Motion



Freeze (The Closure)



Release (Beta-Reduction)

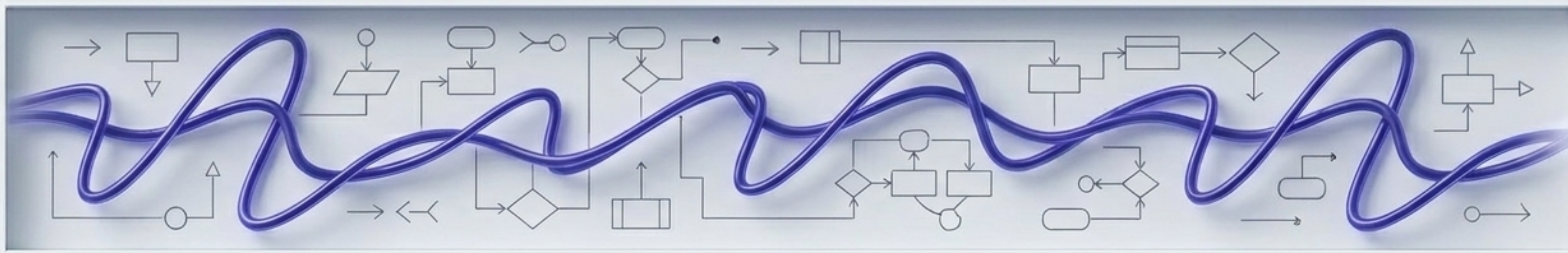
```
Value::Closure {
  param: Symbol,
  param_ty: Type,
  body: Box<Term>,
  env: Env,           // frozen reachability
                    // context
}
```

Replay Equivalence

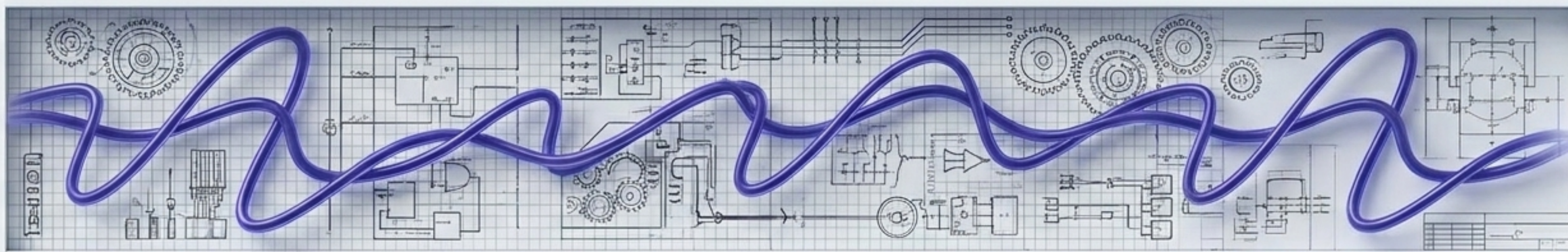
Output equivalence is strictly weaker. A compiler is only correct if it mathematically reconstructs the exact historical trajectory.

$$I(p).history = V(C(p)).history$$

Interpreter

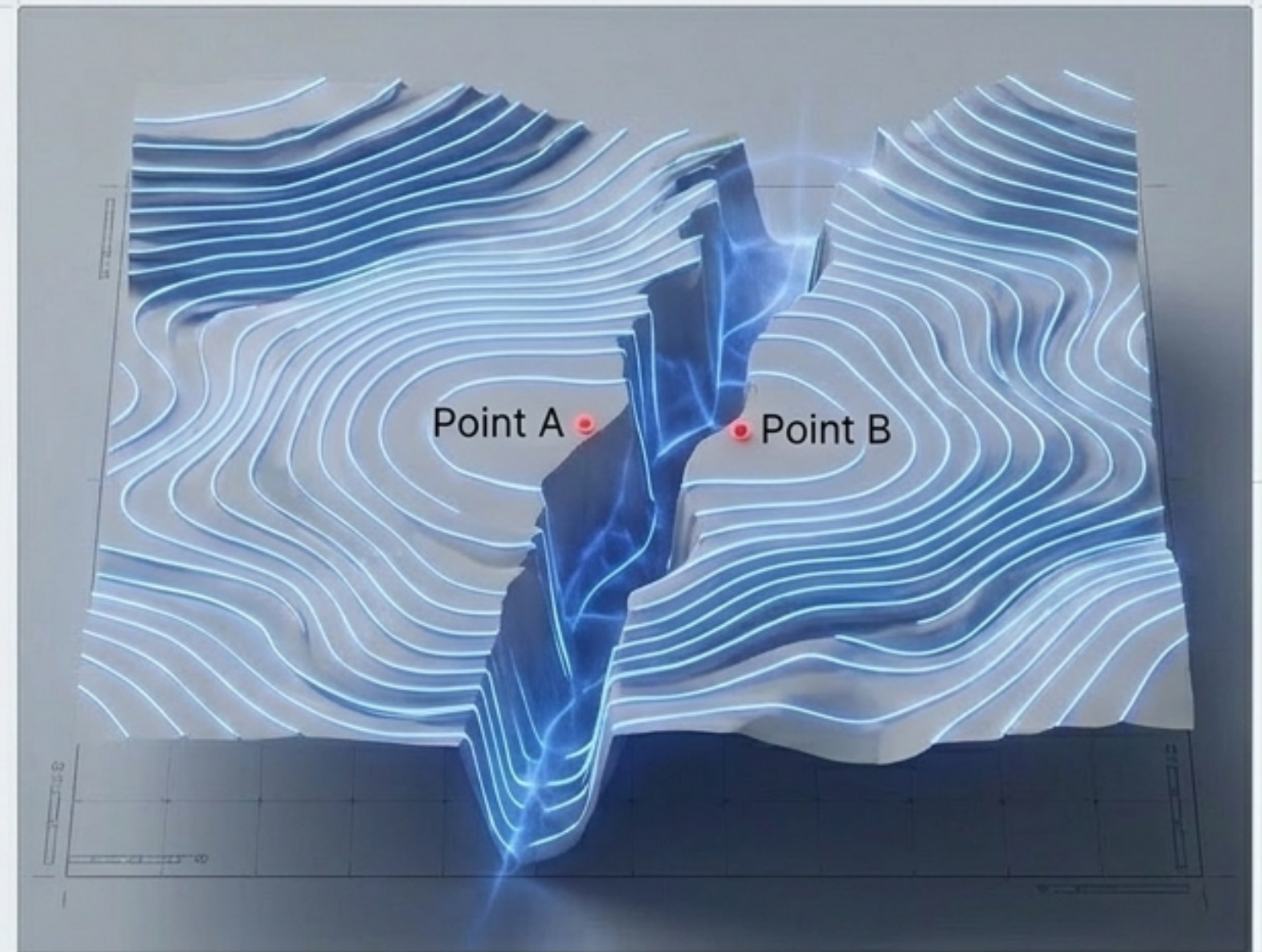
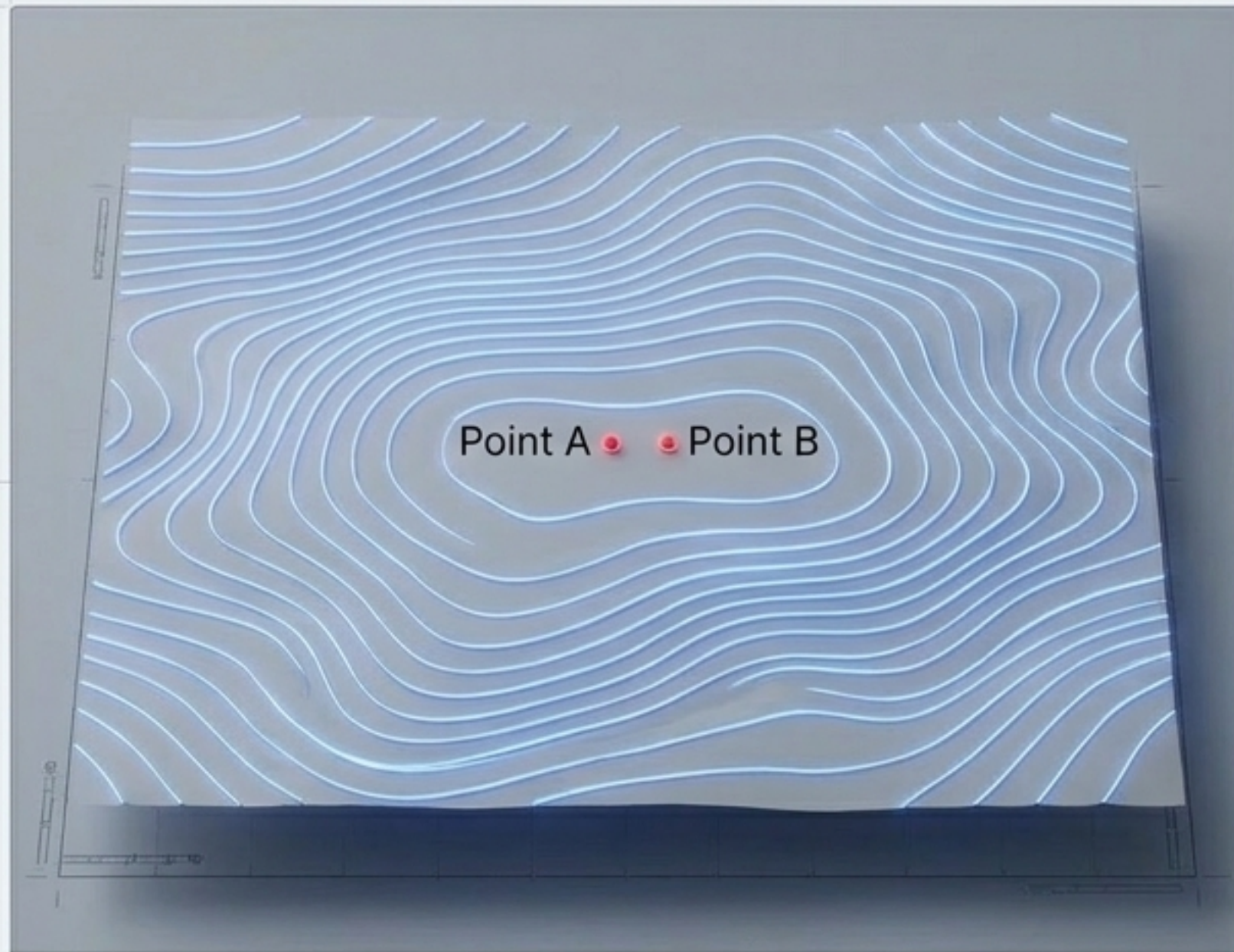


Compiled VM



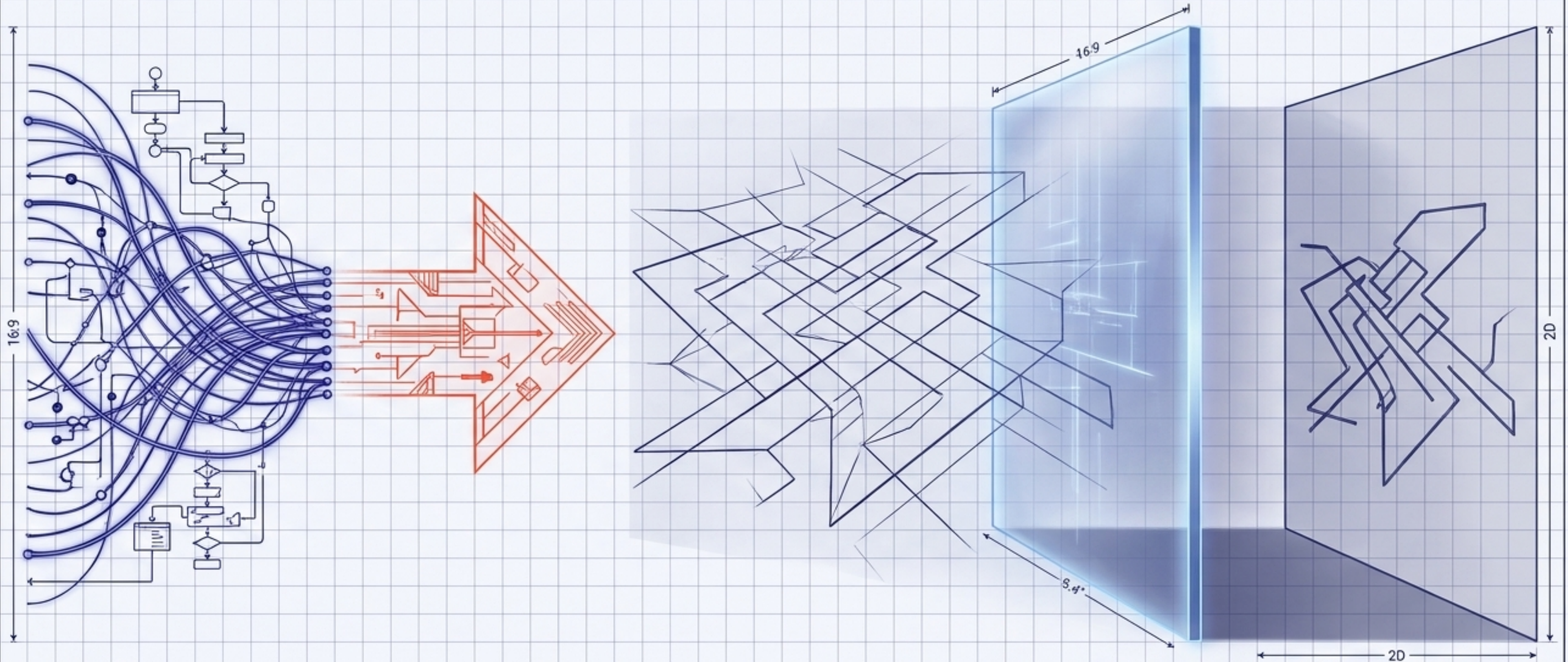
Filters Create Worlds

Representations do not merely lose information—they reorganize the topology of distinguishability. A finer collapse rule amplifies tiny historical distinctions into maximal topological separations.



The Two-Projection Architecture

Programs are not just histories. They are operators that deform admissibility fields. State is merely a projection of a projection.



World Space
(Total Space)

Forward Projection
Indicate of sculption

Future Geometry
(Admissibility Field)

Observational Projection
(The Collapse Rule)

Observable State
(The Local View)

“These questions are not more abstract; they are more honest. They expose what computation actually does to the geometry of possibility.”

Conventional Questions

What is the current state?

What is the output value?

Is there a bug?

What did the function return?

Spherepop Questions

What remains reachable?

What history was constructed?

Which commitment was inadmissible?

Under what rule is the result observable?