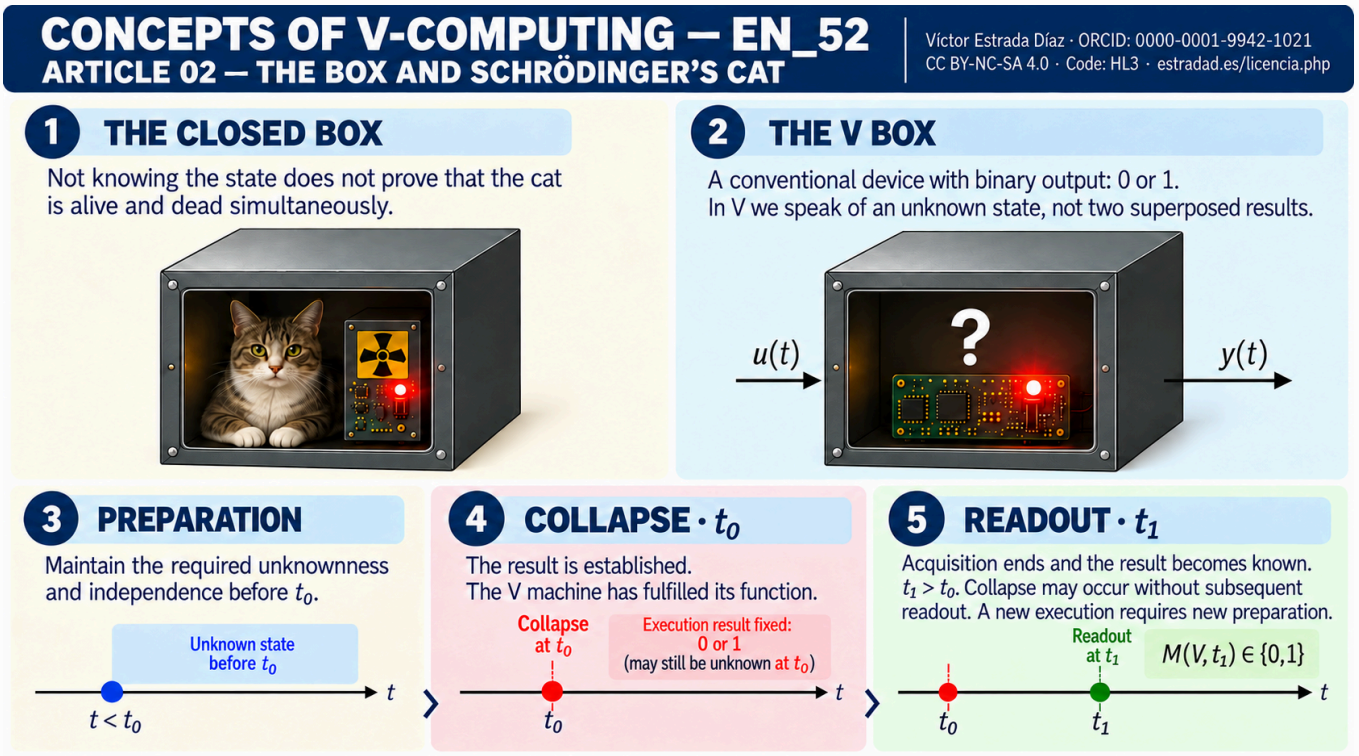
CONCEPTS OF V-COMPUTING — EN_52

ARTICLE 02 — THE BOX AND SCHRÖDINGER'S CAT



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1. PURPOSE

The Schrödinger's cat thought experiment allows us to examine a fundamental question: the distinction between a system's physical state and an observer's knowledge of it.

In V-computing, this distinction is a construction principle.

A system may evolve through deterministic relations without the observer having access to its state.

This article aims to show how the closed box can be used to define unknown states, internal operations and measurements, without attributing physical properties to lack of knowledge that do not follow from it.

The box is not a quantum mechanism. It represents the observer's inability to access the state.

2. THE CAT AND THE BOX

Consider a closed box containing a cat and a device whose operation may affect its survival.

While the box remains closed, an external observer does not know the cat's state.

We denote:

G(t) = physical state of the cat at time t

K(O,G,t) = observer O's knowledge of that state

These concepts must remain distinct.

The observer does not know the cat's state, but this circumstance does not prove that the cat is alive and dead simultaneously.

The description "alive or dead" identifies mutually exclusive alternatives for the result of an ordinary observation.

The description "alive and dead simultaneously" is a different physical claim that does not follow from the observer's ignorance.

Schrödinger's thought experiment addresses precisely the problem of relating quantum description to macroscopic experience.

Formal superposition of quantum states must therefore not be confused with simple lack of knowledge of a classical alternative.

3. WHAT THE CLOSED BOX DOES NOT PROVE

The closed box prevents access to certain information.

It does not, by itself, prove:

A. That the system lacks a physical state.

B. That the physical state depends on a human observer opening the box.

C. That all imaginable alternatives are realized simultaneously.

D. That the act of knowing necessarily creates what is observed.

These conclusions would require grounds independent of mere lack of knowledge.

The reverse claim must also be considered: the closed box, by itself, is not general proof that all physical systems possess pre-existing classical values for every possible measurement.

V-computing does not need to resolve that general question to define and build its own machines.

It needs to specify the V machine's relations and check its results.

4. FROM THE CAT'S BOX TO THE V BOX

Replace the cat with a conventional device with a binary output.

The device can produce the physical values 0 or 1.

Let x(t) be its internal state.

Let y(t) be its output:

$y(t) = G(x(t))$

Construction determines the relation G.

The device remains inside a box that prevents the observer from knowing its state.

In the V-computing protocol, the state is unknown to the observer before measurement is performed.

This does not mean that the device physically contains two simultaneous results.

It means that there is operational inaccessibility defined by construction.

At $t = t_0$, collapse establishes the execution's result. Readout completed at t_1 allows it to be obtained:

$M(V,t_1) \in \{0,1\}$

The box allows the machine's internal evolution to be separated from the knowledge acquired by the observer.

5. TIME AND THE MEASUREMENT EVENT

We explicitly introduce time.

Let f(t) be an internal function describing the system's evolution according to the relations governing its operation.

Let t_0 be the instant of collapse and t_1 the instant when acquisition of the result is completed.

Before t_0, the system's state is unknown to the observer within the established protocol.

The machine continues its physical evolution according to its internal relations.

Collapse at t_0 establishes the result. Readout completed at t_1 makes it possible to know it:

$M(V,t_1) \in \{0,1\}$

Before collapse, that execution's result has not been established.

The physical system and its temporal evolution exist.

The result is established at t_0, even though its recipient does not know it until t_1. That person or machine may complete readout after collapse.

6. COLLAPSE IN V-COMPUTING

In V-computing, we call the event that establishes the execution's result at $t = t_0$ collapse.

At that instant, the execution's result is resolved, even though it is still unknown to whoever will read it.

Collapse is not introduced as an additional logic gate or an artificial mechanism intended to imitate a supposed internal transformation of another machine.

Collapse completes that execution's function. Readout allows acquisition of the result and may be completed later.

The temporal representation is:

$t < t_0$ State unknown to the observer

$t = t_0$ Collapse: result established, not yet necessarily known

$t = t_1$ Acquisition completed: result known; $t_1 > t_0$ if readout finishes later

The knowledge acquired at t_1 corresponds to the result established at t_0. Collapse may occur without subsequent readout. A new V execution requires repeating preparation, including the required unknownness of the inputs. This distinction is developed in EN_52_04.

7. THE CORRESPONDENCE BETWEEN Q_β AND Q_v

Consider a quantum unit Q_β and a V-computing unit Q_v.

Both are subjected to a binary measurement protocol.

For Q_β:

$M(Q_\beta,t_1) \in \{0,1\}$

For Q_v:

$M(Q_v,t_1) \in \{0,1\}$

The state corresponding to measurement is unknown to the observer before it is performed.

When acquisition is completed at t_1, both operations provide a definite binary value.

From the perspective of binary readout, the correspondence is explicit.

However, obtaining the same possible values does not, by itself, prove that two machines produce the same correlations, interference or results under any sequence of operations.

The elementary Q_β/Q_v correspondence therefore allows a common operational vocabulary to be built, while circuit equivalence must be established through tests.

8. AN EXAMPLE WITH A DETERMINISTIC RELATION

Let us build a binary V device with an inverting relation.

Let b(t) be its binary input and z(t) its output.

We define:

$z(t) = 1 - b(t)$

This relation is deterministic.

If the input is 0, the output is 1.

If the input is 1, the output is 0.

The observer remains isolated from the input and output before readout.

During that interval, the state is unknown to the observer.

Collapse at t_0 establishes the result; on completing readout at t_1, the observer obtains that definite result.

It is not necessary to introduce a superposition of values to build the inverter, execute its operation or read its result.

This example demonstrates the possibility of building an elementary V unit with an operationally unknown state and deterministic output.

It does not, by itself, prove that this inverter reproduces every operation of a qubit subjected to general quantum transformations.

9. THE DIFFERENCE BETWEEN IGNORANCE AND SUPERPOSITION

Lack of knowledge and superposition must not be used as synonyms.

Lack of knowledge describes a limitation of the observer’s information.

In quantum mechanics, superposition belongs to the state formalism and allows effects such as interference to be calculated.

Stating that an observer does not know the state does not prove that superposition exists.

Stating that a V machine operates without quantum superposition does not automatically prove that it can reproduce every quantum phenomenon either.

ES_52 research consists of building specific V relations and subjecting them to the relevant tests.

The aim is to establish which operations associated with quantum systems can be built with conventional electronics and software without simulating amplitudes.

10. CONCLUSION

The closed box represents a limitation of access to information.

The physical system does not need the observer in order to evolve.

In V-computing, its evolution is determined by internal relations, even though the state is unknown before measurement.

Collapse at $t = t_0$ establishes the execution's result. Knowledge of it is completed through acquisition at t_1, which may be later.

This construction allows operational concepts of measurement and unknown state to be used without relying on quantum mechanics to underpin the V machine's operation.

The cat's box thus serves as a conceptual tool for separating existence, knowledge and observation.

Construction and testing will determine which correspondences can be established between Q and V.

11. RELATION TO THE SERIES

Previous article:

EN_52_01 — To exist is not to be observed.

Following articles:

EN_52_03 — The Q_β bit and the Q_v bit.

EN_52_04 — Collapse at $t = t_0$ and measurement.

EN_52_05 — The internal function f(t).

EN_52_06 — Relations and superposition.

EN_52_07 — Correlations and Bell.

END OF ARTICLE 02