

## 1. Definition of the vector and base space

Point A (3,1) and Point B (5,4) are located in a two-dimensional plane. The vector  $AB = (B_x - A_x, B_y - A_y) = (5 - 3, 4 - 1) = (2, 3)$

This vector is the traditional representation in a Euclidean plane, but it introduces an extended analysis that considers:

**Free vectors:** Associated to points with respect to a reference frame.

Rotations and transformations: When space is not Euclidean, effects may arise due to non-linear or quantum structures (e.g. "gravity in 4 dimensions").

## 2. T-depth (3): Quantum algorithm and its components

The mentioned algorithm seems to be based on a quantum circuit with the following characteristics:

**T-depth(3):** It could refer to a decoupled or out-of-phase state in the quantum domain.

Hamiltonian cross: An operator that acts as a basis for calculating the evolution of the quantum system.

Sub-G with 3 wires or connectors: Probably denotes a three-qubit circuit that implements some controlled interaction.

## QLSS (Quantum Linear System Solver) output:

This type of algorithm solves linear systems of equations in the quantum domain.

It is especially useful for problems such as reverse reflections or physics simulations.

The mentioned equation:

$$T_{\text{depth}}(3) = \log_2(1/\epsilon_{\text{ear}}) + 2(Q + d) + D_{\text{cbe}} + 4(Q + d)T(\text{DSP}) + Q(24l + 31) + 3d \cdot \log_2(1/\epsilon_z) + d(32l - 2)$$
$$T_{\text{depth}}(3) = \log_2(1/\epsilon_{\text{ear}}) + 2(Q + d) + D_{\text{cbe}} + 4(Q + d)T(\text{DSP}) + Q(24l + 31) + 3d \cdot \log_2(1/\epsilon_z) + d(32l - 2)$$

## It appears to combine:

Logarithmic factors ( $\log_2 \log_2$ ) for quantum optimization.

Dependent terms on

$Q, Q, d$

$d, l, l$ , and additional constants.

This suggests that the algorithm is optimizing quantum efficiency under certain logarithmic bases.

## 3. Inverse reflection in a suspended space (4D tetrahedron)

The notion of reflections in vectors and non-Euclidean spaces introduces advanced geometry:

### Mirror of vectors under gravity:

In a 4D space (tetrahedron), planes reflect objects as if they were immersed in higher dimensions.

The suspension of the quantum circuit in a "gravity tree" represents a multidimensional projection.

Geometric transformations: Vectors are mapped with inverse transformations depending on the reflections and curvature of space.

#### 4. Quantum algorithm applied to vectors

For further analysis, the following can be interpreted:

**Ultrasonic velocity:** If represented as a plane with velocity in another dimension, this must be a free vector

$\vec{v}$

that evolves in time  $t$ ,  $t$  under a metric that includes quantum curvature terms (not necessarily Euclidean).

**Tetrahedral spaces:** Each rotated dimension generates an associated plane that affects the state and position of objects.

#### 5. Technical analysis proposal

To formalize your research, you can move forward with the following points:

##### **Simulation in MATLAB or Python:**

Model rotations in a three-dimensional or four-dimensional space.

Use transformation matrices ( $R_x, R_y, R_z, R_x, R_y, R_z$ ) and quaternionic extensions for 4D projections.

##### **Quantum circuits:**

Implement a basic model of the mentioned circuit using Qiskit or Cirq.

Design the reflection and rotation operations as quantum gates.

##### **Advanced geometry:**

Analyze how coordinates are transformed in suspended spaces.

Integrate concepts such as metric tensors to understand dimensional projections.