

Problem 5 Quantum Fingerprint

Creative integrity and tamper detection

Can a quantum experiment help people explore whether digital content has changed?

The theme

Build an application that investigates digital fingerprinting, integrity checks, or tamper detection using Qiskit circuits. Map selected characteristics of a digital object into quantum states or circuit parameters, then develop a way to compare or verify results. Focus on a thoughtful experiment and a clear user experience rather than claiming security from entanglement alone.

Ideas to explore

- Can a digital artwork have a circuit-based fingerprint?
- How might subtle edits affect a repeatable verification experiment?

Prototype requirements

Demonstrate a mapping from input to circuit, an observable verification or comparison workflow, and tests using original and modified inputs.

Scope note. This is an exploration of integrity and fingerprinting, not automatically a secure watermark or digital signature. Describe collisions, noise, and other limitations honestly.

Judging criteria

- Design of the quantum fingerprinting approach: 30 points
- Tampering experiment and evaluation: 25 points
- Understanding of encoding and measurement: 20 points
- Creativity and usability: 15 points
- Limitations and clarity: 10 points