

Fidelity Criterion

[Go up to Terms and Definitions](#)

Discussion

A Fidelity Criterion specifies an acceptable degree of correspondence between a representation and the characteristics it represents.

Within a [Twin Relationship](#), Fidelity Criteria establish the conditions used to assess whether a [Twin Realization](#) represents an applicable characteristic with sufficient correspondence for the intended purpose.

Fidelity Criteria may address numerical tolerance, temporal accuracy, behavioral correspondence, state correspondence, completeness, resolution, or other measurable characteristics.

Fidelity is purpose-dependent. A Twin Realization may satisfy the Fidelity Criteria for one Test Definition while failing the criteria established for another.

Definition

a criterion that specifies an acceptable degree of correspondence between a representation and the characteristics it represents

Source

- [\[DTE1\] U.S. Patent Application US20220237111A1](#), comparison and validation of virtual and physical Twin Nodes
- [\[DTE2\] Non-Traditional BAA Submission](#), Digital Twin concepts, scenario testing, and comparison
- [\[DTE9\] Distributed Immutable Data Object Reference Architecture \(DIDO-RA\)](#), Digital Twin concepts
- DIDO-TE normalization of the source concepts

Note

A Fidelity Criterion does not require exact equality between a representation and its referent.

The applicable Test Definition, Configuration, requirement, or governing source establishes the acceptable level of correspondence.

Multiple Fidelity Criteria may apply to the same Twin Relationship.

Example

A Test Definition requires a virtual Twin Realization to reproduce a measured pressure value within ± 1 percent and within 50 milliseconds of the corresponding real-world observation.

The numerical tolerance and timing tolerance form Fidelity Criteria for that test.

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Last update: **2026/08/20 15:21**

