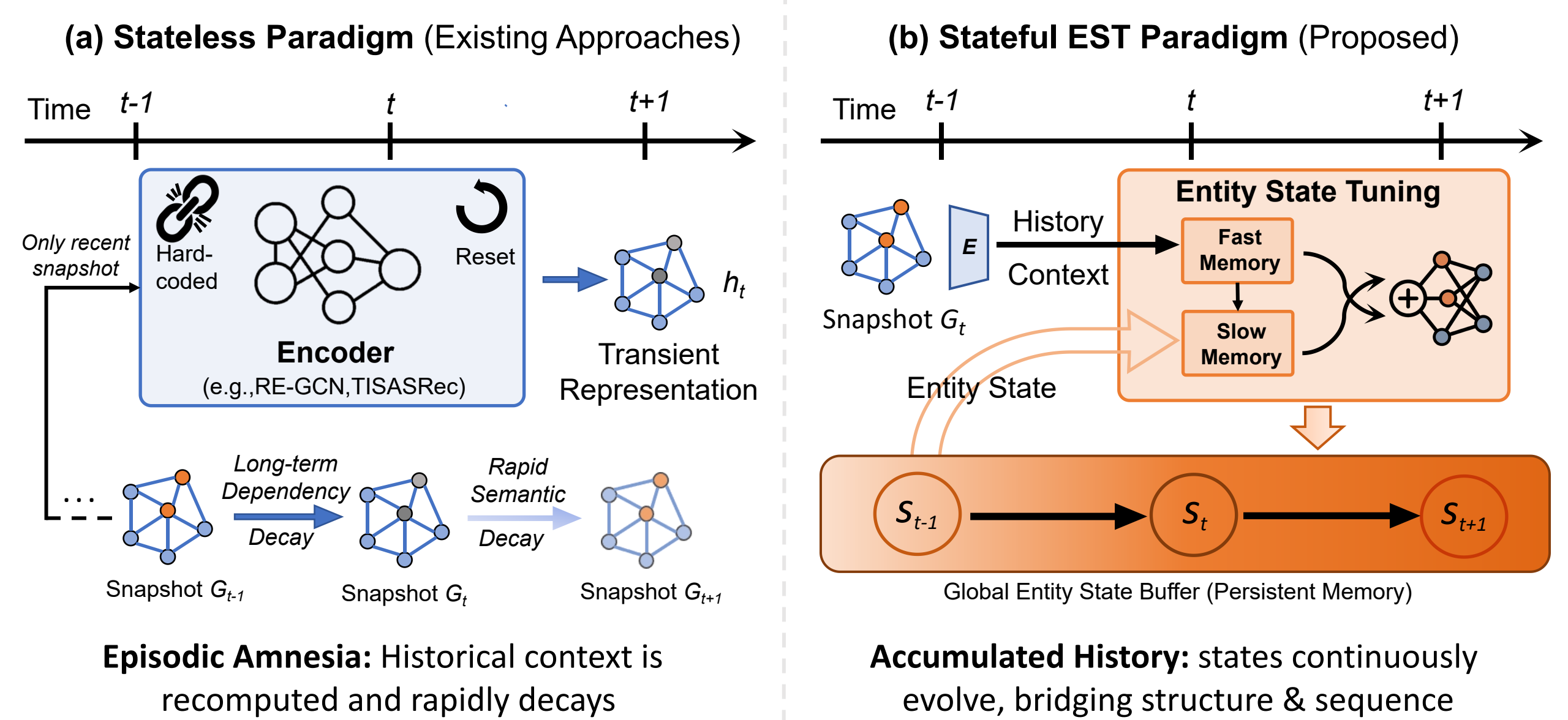
(a) Stateless Paradigm (Existing Approaches)
Time
t-1
t
t+1
Only recent snapshot
Hard-coded
Reset
Encoder
(e.g.,RE-GCN,TISASRec)
h_t
Transient Representation
Long-term Dependency Decay
Rapid Semantic Decay
Snapshot G_{t-1}
Snapshot G_t
Snapshot G_{t+1}
Episodic Amnesia: Historical context is recomputed and rapidly decays
(b) Stateful EST Paradigm (Proposed)
Time
t-1
t
t+1
Snapshot G_t
E
History
Context
Entity State Tuning
Fast Memory
Slow Memory
Entity State
S_{t-1}
S_t
S_{t+1}
Global Entity State Buffer (Persistent Memory)
Accumulated History: states continuously evolve, bridging structure & sequence