

OBSERVER PERCEPTION-REFLECTION DYNAMICS: A SHARED PARADIGM IN HUMAN-MACHINE TEAMING FOR ADAPTIVE PREPAREDNESS

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Problem

How do observers create their reality? How do they update and exchange awareness states (e.g. beliefs, intentions, etc.) with one another?

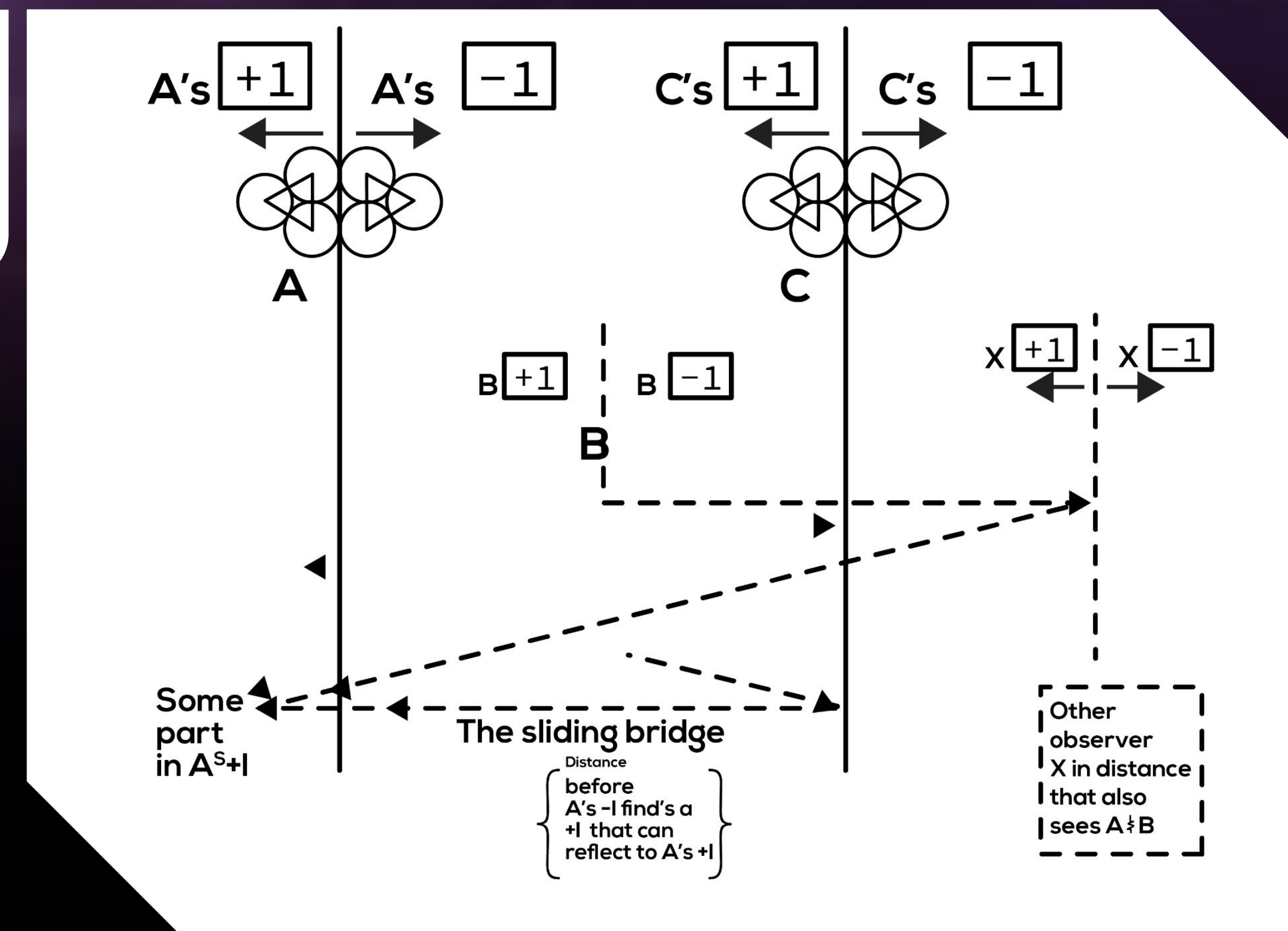


Research Objective

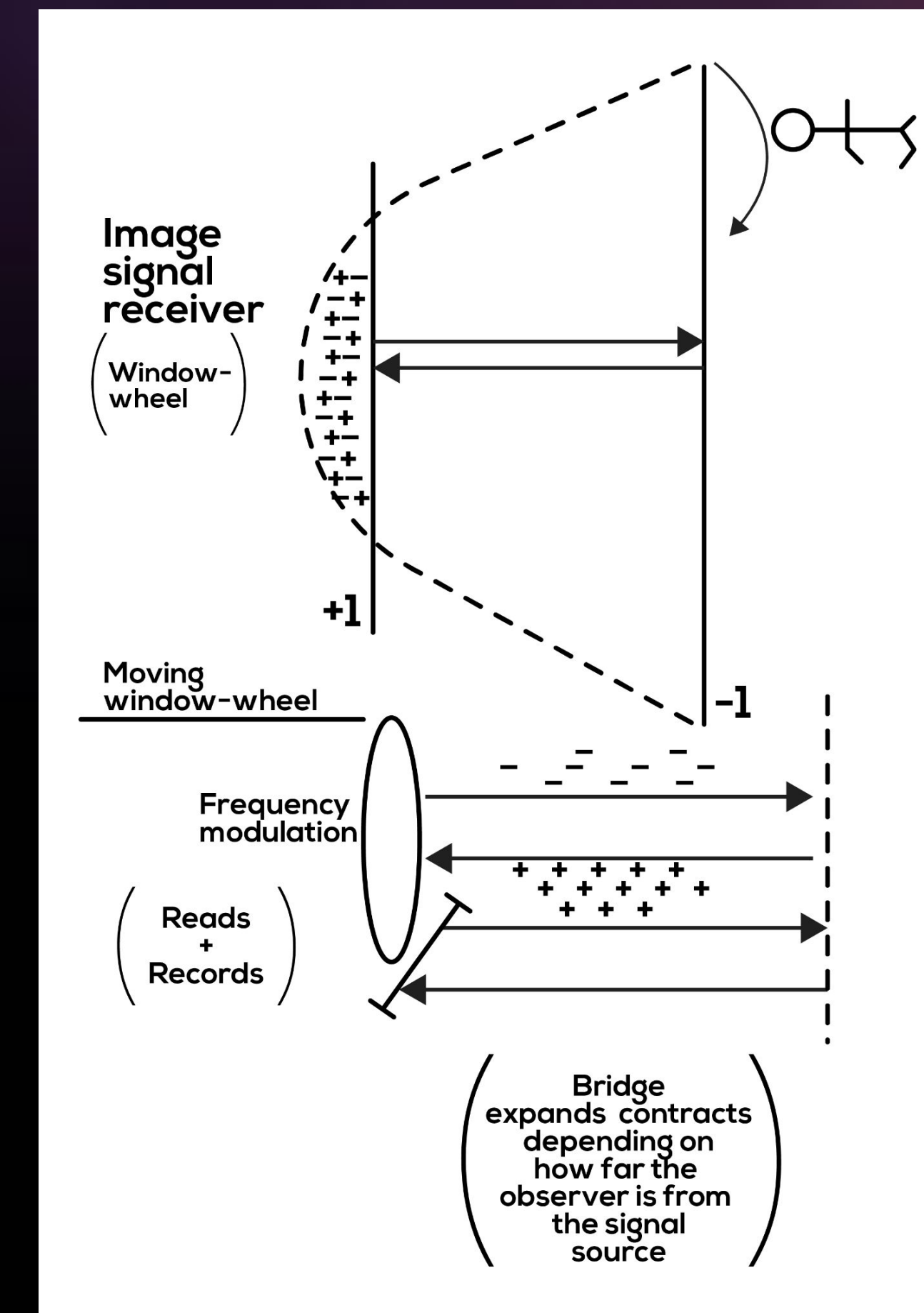
Modelling perception and reflection dynamics of event and object observation to highlight subjectivity and limited scope of truth and reality. Towards limitation-aware information sharing in human-machine teams.

Insight:

- ❑ Truth and reality evolve based on observer
- ❑ Same initial event results in alternative realities based on diff observation sequences
- ❑ Each observer has positive and negative regions in their observation spectrum
- ❑ -ve observations are those outside the scope of direct observation of a given observer i.e. in the -ve spectrum
- ❑ This region can be observed latently through messages received from other observers that have it in their +ve spectrum
- ❑ When object is in observer's -ve, it may as well be non-existent unless an observer exists that can observe it in the +ve.
- ❑ In this way, we argue that an object or event begins to exist in response to existence of an observer at a suitable vantage point



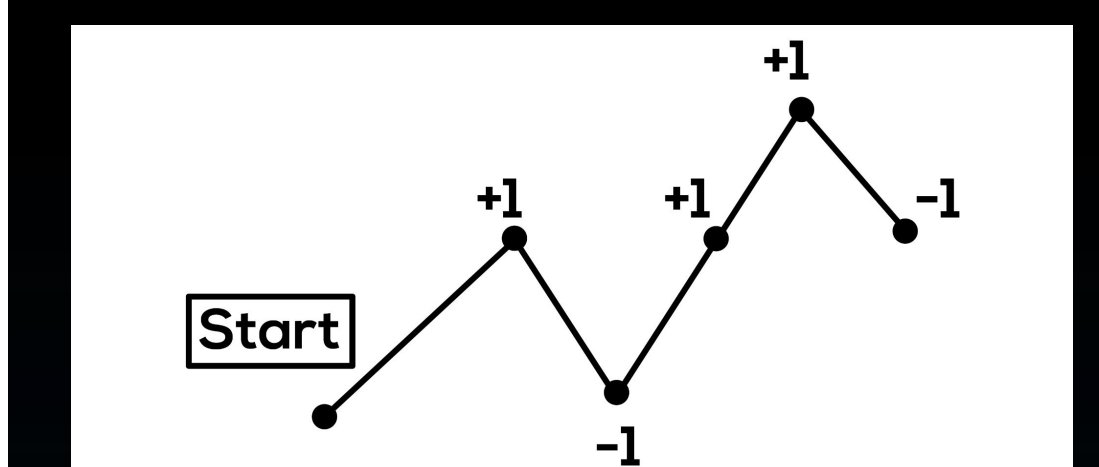
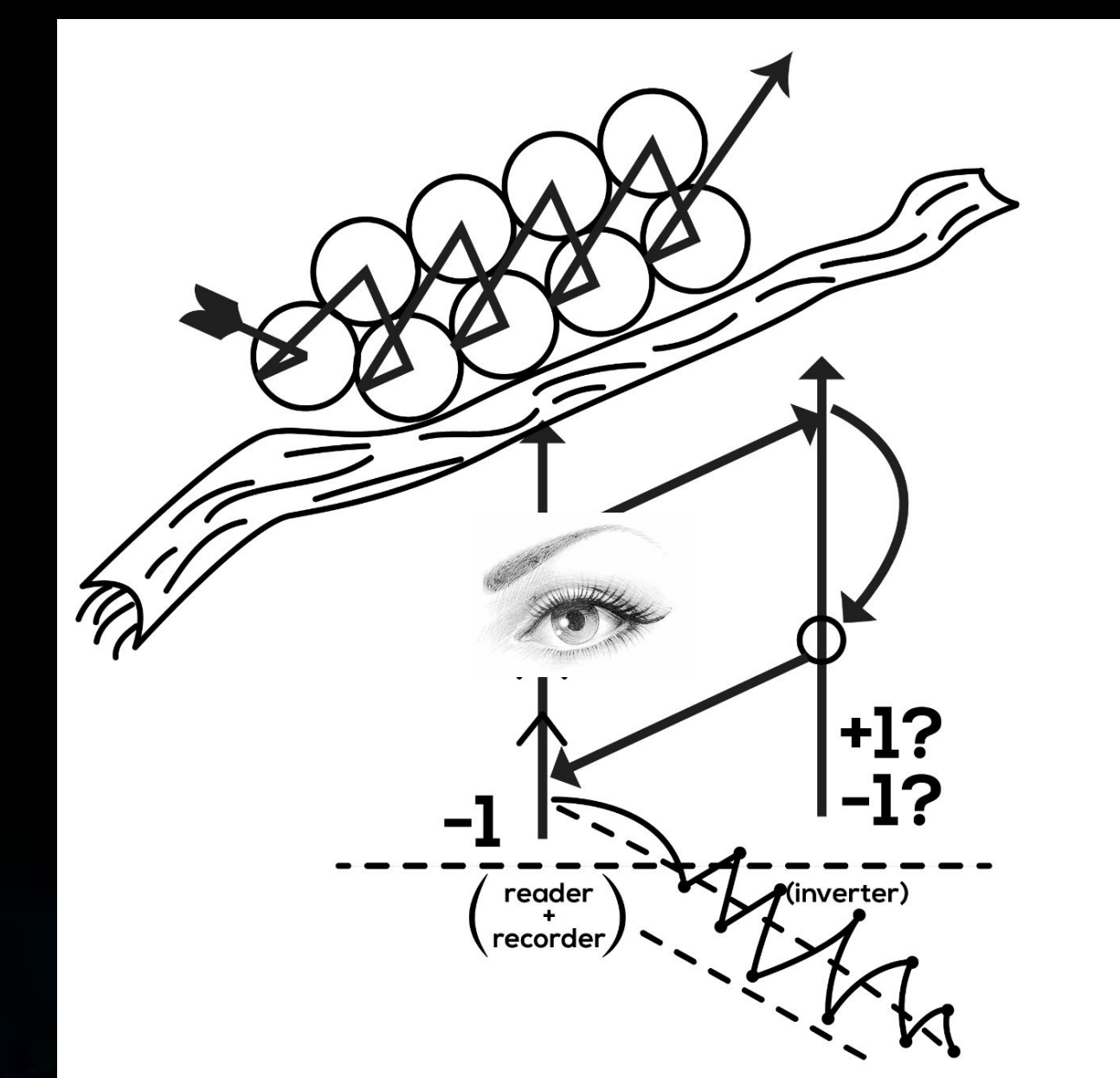
- ❑ When a previously non-existent object 'begins to exist' courtesy of a new observer that has it in the +ve, it can be relayed to an observer that previously had it in their -ve spectrum, causing them to also 'observe' it but latently so.
- ❑ This 'latent observing' can be modelled as inversion of previously -ve sensory input signal to +ve signal
- ❑ Latent observations contain interference i.e. original and all intermediate observers' bias (projections, reflections & actions).
- ❑ Multiple latent observations of the same object by an observer amounts to 'over-observation' i.e. an observation error



- ❑ Each observation cycle begins with a sampling of input and a simultaneous reflection of a relevant pre-understood context.
- ❑ When the sampled input and the observers stored context come together, an observation cycle is completed and a new node is added to their memory graph.
- ❑ The more observed (i.e. many direct or latent observations) an object/event gets, the more 'true' it becomes.
- ❑ The less observed, the more it tends towards 'false'

Applications Include:

- Adaptively assigning truth score to information, based on strength of observation



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