Review of: "Exploring the causal Minkowski-like spaces of observer ensembles and their relational event universes"

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Potential competing interests: No potential competing interests to declare.

This is a well-designed study that focuses on modeling observational events in the natural sciences. For such modeling, dynamic events and the space-time structure of their representation were successfully chosen. This allowed the authors:

• create a new mathematical picture of the universe,

• describe a set of events with a dendrogram - a finite tree,

• implement the dynamics of events in the dendrogram configuration space.

In a dendrogram, all events are interconnected through a hierarchical relational tree structure. The authors called this approach the dendrogram holographic theory, which is statistical in nature. The novelty of the approach is well illustrated by visualization of the simulation results. This approach provides a new mathematical and physical understanding of this area of research, which is based on:

• connection of physical models of relational events with traditional models based on real space-time,

• introduction to the statistical causal structure of the dendrogram configuration space, which reflects the dendrogram dynamics of ensembles of observers.

• encoding the dendrogram with real parameters. This is a new approach to causation.

This approach can be used outside of natural science in the transdisciplinary cognitive space of dynamic events, in which a time series of various natures is transformed into an individual cognitive graphic image (signature) (.DOI: 10.1038/srep29512). Smart materials signatures are given in doi.org/10.15407/fm24.02.212. For medical diagnostics of transient functional states, signatures of electrophysiological signals are of interest.

https://doi.org/10.21272/jnep.12(6).06018. The development of these ideas for artificial intelligence is given in DOI: 10.26855/er.2022.04.001.

Visualization of dynamic events in the cognitive space contributes to the development of systemic thinking and structuring of discrete processes through emotional memory, which has a holographic nature.