Theory of mechanical information

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Spacetime

The information machinery familiar to the twenty-first century may be formalized as an Interaction Machine. The heir to Turing's Choice Machine, differentiated from Turing's Tape Machine by opening the tape cell to a world of communicating Choice Machines. The perspective is physical. The machinery that we are familiar with establishes a unique physical reference frame in spacetime.

$$\pi \{ \kappa \leftarrow \mu \}$$

That is, the topological ranges *(κ)* possible from the mechanical domain *(μ)* is a component of information spacetime *(π)*.

This component is representational. We could define the mechanical spacetime reference frame topologically in analysis.

$$\kappa_\sigma \leftarrow \delta_\sigma$$

The physical distinction in spacetime is due to a linear temporal length scale *(σ)*.

However, comprehension of information spacetime reconsiders the topological object.

The mechanical topology of communications networks is a complex frame of reference. A multiplicity of physical reference frames conglomerated into a mechanical reference frame. The internet on Mauna Kea at two thousand meters above sea level, or the internet in space, is in a distinct physical reference frame from internet near sea level. The physical topology is physically complex.

Mechanical spacetime is increasingly complex, with each layer constructed over physical spacetime. This object of conception recognizes a critical problem-solution domain. There is no simple, convenient, naive physical reference frame on the internet, and this fact is reflected in the use and application of internet technologies. There is no simple, convenient, naive mechanical spacetime reference frame on internet topologies.

A network graph of distance relations is not properly defined in a temporally constant frame of reference. Physical topology is properly conceived *in situ* as a

part of spacetime. The temporally constant frame of reference recognizes the distinct concepts of space and time. The observation of physical topology requires a reference frame that is comprehensive of physical spacetime as spatially constant and temporally linear.

Therefore, the world of the Interaction Machine is information spacetime. Properly conceived, we can develop the concept with the structure and production of information. In one approach, information and noise with binary representation coding as familiar to communication. In that case, the relativistic component identifies a degree of complexity in the understanding of topological message flows. In another approach, espoused here, the information facility of structure and production as familiar to programming languages and systems. In this case, the recognition of relativity serves to ensure the integrity of theory.

The recognition of information spacetime establishes the mechanical frame of reference of the Interaction Machine. The conception prefaces the conception of the informational frames of reference employed by information architecture. The mechanical frame is a last physical frame of reference preceding informational frames of reference. In expression of self or record of other, an informational frame of reference adopts a metaphysical component.

The components of the mechanical frame of reference include informational spacetime ($\kappa \leftarrow \mu$), informational association ($\nu \leftarrow \rho$), and informational structure ($o \leftarrow \tau$).

$$\begin{aligned}\pi \{ & o \leftarrow \tau, \\ & \nu \leftarrow \rho, \\ & \kappa \leftarrow \mu \\ \} &\end{aligned}$$

The association of reference (ρ) to object (ν) establishes data space, a facility of organization. The structuring of data (o) to the knowledge of data structure (τ) is the principal facility of organization.

The production and maintenance of structured data is the operational role of the machine in information spacetime (π). The operation of the Interaction Machine occurs in this frame of reference. The Interaction Machine is a member of this frame of reference.

Association

The facility of association of reference to object of data establishes a persistent space of information.

Structure

The facility to structure objects of data according to an assigned structure establishes a coherent, regular space of information.

Review

The mechanical frame envelops the Interaction Machine. The design and implementation of an Interaction Machine occurs in a physical reference frame, defined as topological spacetime, association of reference, and the assignment of structure to data.

The conception of frame as the composition of critical knowledge is elementary to framing, as demonstrated in a progression from physical to metaphysical components. In this case, a valued distinction between physical and metaphysical concepts. Information, association, and structure are physical concepts. The physicality of the frame is substantial to the work that occurs within the frame.

Future work

The development of the space enveloped by the mechanical frame.

The development of metaphysical information framing.

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Theory of mechanical information
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