ELECTRONIC NEWSLETTER ON
REASONING ABOUT ACTIONS AND CHANGE

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Today

Today, Pat Hayes answers Jixin Ma and argues in favor of an ontology for time where intervals are the only elementary concept and timepoints play a secondary role.

Debates

Ontologies for time

From: Pat Hayes

Im largely in agreement with Jixin about points and intervals, although I dont think its got anything to do with knowledge, and I think there's a simpler way to say it all.

First, just forget about whether intervals are open or closed. This

the continuum does) that an interval is a set of points. But if we take

The question of which interval 'contains' the meeting point is meaningless. This gives a very simple, elegant formulation in which points are totally ordered, intervals are uniquely defined by their endpoints (which are also the points they fit between) and two intervals meet just when the endpoint of the first is the startpoint of the second. That's all the structure one needs. Truths hold during intervals. One can allow instantaneous intervals, whose endpoints are identical and which have no duration. One can, if one wishes, identify the interval $< t, t > t$, since such an interval makes no 'space' when interposed between two others, ie if $< a, b >$ meets $< b, b >$ meets $< b, c >$, then $< a, b >$ also meets $< b, c >$; but it is also consistent, if one wishes, to distinguish t from $< t, t >$, or even to forbid

say that time is continuous except in a certain class of 'momentary'

which things like flashes of lightning must occupy.)

(Instantaneous intervals have the odd property of meeting themselves,

http://www.coginst.uwf.edu/ phayes/TimeCatalog1.ps

http://www.coginst.uwf.edu/ phayes/TimeCatalog2.ps

One can cast the whole theory in terms of a single three-place relation MEETS-AT between two intervals and a point, much as Allen's original theory can be cast in terms of MEETS.)

In this theory, to talk of the set of points 'in' an interval requires

$< a, b >< b, c > b$

Jixin says that "one cannot talk about anything about the switching

to say that something is true *at* it. Some truths may be instantaneous, ie true only at points; others make sense only when asserted to hold

might be enduring, while changes in illumination, or isolated flashes, can be instantaneous. So for example suppose it is dark during interval $< s, t >$ and the switch is hit at t. If the light stays on, we have two meeting intervals. If the light flashes and immediately burns out (put a 120 V bulb in a 230 V socket), one could say that there is a flash at t, surrounded on both sides by extended intervals of darkness. Both stories are perfectly consistent. It follows, for example, that a

Pat Hayes

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