

Topological relationships between spatio-temporal history of moving points in a primitive space

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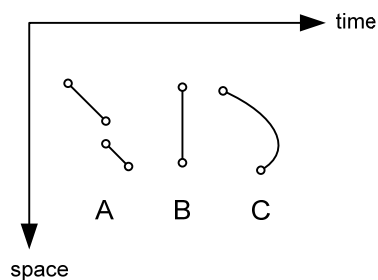
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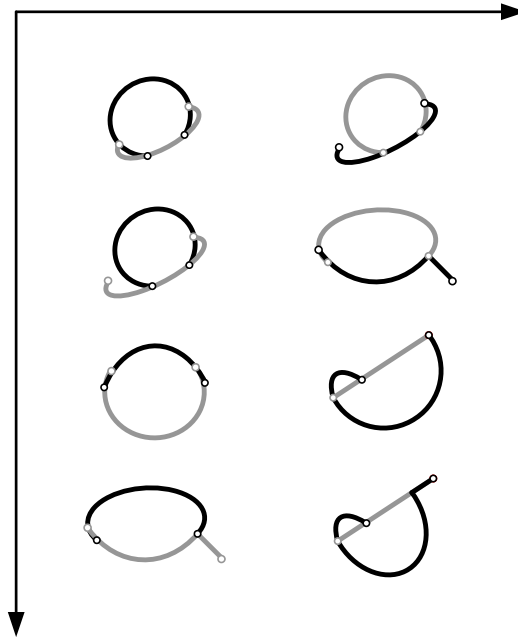
Due to the improvement of data acquisition techniques, we have now to manage a huge amount of spatio-temporal information. To do so, it is necessary to develop spatio-temporal relationships and operators to fully exploit this kind of data. However, considering time in spatial analyses increases rapidly their complexity (Renz and Nebel, 1999).

One answer to this assessment could be the generalisation of spatio-temporal relationships in a primitive space (Hallot, to appear) with sufficient remaining information to perform analyses. In our precedent work, we establish all the spatio-temporal configuration in a temporal space (Claramunt and Jiang, 2000) for two static points in a 1D space and we generalised their spatio-temporal history in a primitive space. A primitive space is a space where temporal and spatial dimensions are not differentiated. Thus, the number of spatio-temporal relationships is reduced from 26 to 8.

If we now consider two moving points in a 1D space, the description of all their possible spatio-temporal history could be seen in a primitive space as all the topological spatial relationships between two lines (Egenhofer and Herring, 1990). However, as we work with spatio-temporal data we suppose the three following hypothesis. First, the movement are continuous (A), secondly we reject all the instantaneous movement (B) and finally we not allow return in the past (C).



Under these hypotheses we show that some cases of topological relationships are impossible.



The study of these relationships could be an interesting basis to generalize and represent spatio-temporal relationships. This model should provide a simplified way to analyze spatio-temporal relationships.

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