On Embedding a Qualitative Representation a Two-Dimensional Plane

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This paper discuss embedding in a two-dimensional plane a symbolic representation for spatial data using the simple objects, points (p), lines (l), Circuits (C) and areas (A). We have proposed PLCA as a new framework for a qualitative spatial reasoning. In a PLCA expression, the entire figure is represented in a form in which all the objects are related. We investigate the conditions for two-dimensional realizability of a PLCA expression, and derive the relation that the numbers of objects in a PLCA expression should have. In this process, we use the well-known Euler's formula. We also give an algorithm for drawing the figure of the PLCA expression that satisfies this condition ion a two-dimensional plane and prove its correctness. The algorithm generates a quantitative expression from qualitative expression.

Keywords: qualitative spatial reasoning, planar graph theory, spatial database