

On Embedding a Qualitative Representation in a Two-Dimensional Plane

Kazuko TAKAHASHI, Takao SUMITOMO, and Izumi TAKEUTI

This paper discusses embedding in a two-dimensional plane a symbolic representation for spatial data using the simple objects, *point* (P), *line* (L), *circles* (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 in a two-dimensional plane and prove its correctness. The algorithm generates a quantitative expression from qualitative expression.