Sample Proximity Relation Axioms

Chidoteremdu Chinonyelum Uchime
Dept. Electrical & Computer Engineering
University of Manitoba
uchimec@cc.umanitoba.ca

ABSTRACT

This GradCon 2014 report focuses on two of the axioms for what is known as an Efremovic-Leader proximity (nearness) relation. Nonempty sets are spatially near each other, provided the sets have one or more points in common. Efremovic introduced proximity spaces during the first part of the 1930s but his paper (in Russian) was not published until 1952 [1]. Leader introduced his approach to proximity spaces with clustering in 1959, based on his interpretation of Efremovic’s axioms [2]. From considering a proximity relation defined on a nonempty set, we can introduce what are known as set patterns. A set pattern is a collection of sets that are near a given set known as the pattern motif. Set patterns were introduced by Pavlidis in 1968 [3]. For example, by identifying a particular set of pixels M in a digital image X, we can then derive what is known as a spatial motif set pattern by identifying sets of pixels in X that have points in common M. A typical engineering application of proximity spaces and set patterns can be found by considering set patterns in digital images in solving image classification problems. This report presents and illustrates two of Leader’s axioms. A consideration of proximal set patterns is outside the scope of this report.

REFERENCES

