Erratum

Corrigenda to “On Hausdorff-like metrics for fuzzy sets”

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Our paper was motivated by (Chaudhuri and Rosenfeld, 1996), a paper in which several metrics related to the Hausdorff metric are given for fuzzy sets defined on the same nonempty support set S. The first metric given in (Chaudhuri and Rosenfeld, 1996), denoted $F_0$ in our paper, requires all the fuzzy sets considered by $F_0$ to have the same maximum value. Chaudhuri and Rosenfeld (1996) then modify $F_0$ to obtain other metrics we denoted by $F_1$ and $F_3$ in which the assumption of a common maximum value is not necessary. The modifications made to obtain both $F_1$ and $F_3$ call for associating with a fuzzy set $u$, another fuzzy set $u'$ such that $u'(s_0) = 1$ for some $s_0 \in S$ such that $u(s_0) = \max\{u(s) | s \in S\}$.

Unfortunately, we misstated the results of (Chaudhuri and Rosenfeld, 1996) concerning $F_1$ and $F_3$ by incorrectly including hypotheses of a common maximum value for the fuzzy sets considered by these metrics. Statements are given below as they should have appeared in our paper.

Theorem 2.2 (Chaudhuri and Rosenfeld, 1996). Let $e > 0$. The formula

$$F_1(u, v) = \frac{\sum_{k=1}^{m} t_k H(u^{-1}([t_k, 1]), v^{-1}([t_k, 1]))}{\sum_{k=1}^{m} t_k} + \varepsilon \sum_{s \in S} |u(s) - v(s)|$$

(where $|S|$ is the cardinality of S) is a metric for fuzzy sets whose support set is S.

Theorem 3.2 (Chaudhuri and Rosenfeld, 1996). Suppose $\mathcal{F}$ is a family of fuzzy sets with support set S, where S is an uncountable compact metric space, and every member of $\mathcal{F}$ is a continuous function. Then the formula

$$F_3(u, v) = \int_0^1 \mu H(u^{-1}([\mu, 1]), v^{-1}([\mu, 1])) d\mu + \varepsilon \frac{\int_S |u(s) - v(s)| ds}{\int_S ds}$$

defines a metric on $\mathcal{F}$.

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Our paper uses different approaches to the modification of $F_0$ to obtain metrics for fuzzy sets based on the Hausdorff metric. Thus, the errors noted above do not affect the validity of our results.

References