

APPLICATION OF NUETROSOPHIC SOFT EXPERT SET IN S-BOX IMAGE ENCRYPTION

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Decision Support Systems are a precise class of computer-based information systems that support your decision-making activities. A decision support system analyzes data and provide interactive information support to professionals during the decision-making process. Decision making implies selection of the best decision from a set of possible options. In some cases, this selection is based on past experience. Past experience is used to analyze the situations and the choice made in these situations. In this paper, we define the neutrosophic soft expert set and discussed some algebraic properties. We also discuss an application of neutrosophic soft expert set in decision making system. We developed an algorithm based on TOPSIS method and this algorithm consist of ten steps. We apply this algorithm to S-box image encryption for selection of best and suitable S-box of image encryption. S-box is the only component in every block cipher which creates confusion in the data. First we transform the three dimension matrix corresponding to color image with the help of nonlinear component and then use the algebraic structure of neutrosophic soft expert set to choose best substitution box for image encryption based on entropy, contrast, homogeneity, correlation and energy. The analyses shows that the readings of S8 S-box is very good for image data.

REFERENCES

- [1] S. Abdullah, N. Amin. Analysis of S-box image encryption based on generalized fuzzy soft expert set. *Nonlinear Dynamics*, **79** (3):1679–1692, 2015.