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Definition of the Neutrosophic Probability FLORENTIN SMARANDACHE, University of New Mexico — Neutrosophic probability (or likelihood) [1995] is a particular case of the neutrosophic measure. It is an estimation of an event (different from indeterminacy) to occur, together with an estimation that some indeterminacy may occur, and the estimation that the event does not occur. The classical probability deals with fair dice, coins, roulettes, spinners, decks of cards, random works, while neutrosophic probability deals with unfair, imperfect such objects and processes. For example, if we toss a regular die on an irregular surface which has cracks, then it is possible to get the die stuck on one of its edges or vertices in a crack (indeterminate outcome). The sample space is in this case: {1, 2, 3, 4, 5, 6, indeterminacy}. So, the probability of getting, for example 1, is less than 1/6. Since there are seven outcomes. The neutrosophic probability is a generalization of the classical probability because, when the chance of determinacy of a stochastic process is zero, these two probabilities coincide. The Neutrosophic Probability that of an event A occurs is

$$NP(A) = \left(ch(A), ch(indet_A), ch\left(\overline{A}\right)\right) = (T, I, F),$$

where T, I, F are subsets of $[0, 1]$, and T is the chance that A occurs, denoted *ch(A)*; I is the indeterminate chance related to A, $ch(indeterm_A)$; and F is the chance that A does not occur, $ch\left(\overline{A}\right)$. So, NP is a generalization of the Imprecise Probability as well. If T, I, and F are crisp numbers then: $^{-}0 \leq T + I + F \leq 3^{+}$. We used the same notations (T,I,F) as in neutrosophic logic and set.

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