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Annual Rainfall Forecasting by Using Mamdani Fuzzy Inference System

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Long-term rainfall prediction is very important to countries thriving on agro-based economy. In general, climate and rainfall are highly non-linear phenomena in nature giving rise to what is known as "butterfly effect". The parameters that are required to predict the rainfall are enormous even for a short period. Soft computing is an innovative approach to construct computationally intelligent systems that are supposed to possess humanlike expertise within a specific domain, adapt themselves and learn to do better in changing environments, and explain how they make decisions. Unlike conventional artificial intelligence techniques the guiding principle of soft computing is to exploit tolerance for imprecision, uncertainty, robustness, partial truth to achieve tractability, and better rapport with reality. In this paper, 33 years of rainfall data analyzed in khorasan state, the northeastern part of Iran situated at latitude-longitude pairs (31°-38°N, 74°- 80°E). this research attempted to train Fuzzy Inference System (FIS) based prediction models with 33 years of rainfall data. For performance evaluation, the model predicted outputs were compared with the actual rainfall data. Simulation results reveal that soft computing techniques are promising and efficient. The test results using by FIS model showed that the RMSE was obtained 52 millimeter.