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Neuro-fuzzy inference system for operation of a multi-purpose reservoir

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Abstract In recent years soft computing techniques have been used increasingly by water resources engineers to model complex water resources systems. These techniques have the ability to mimic the human way of reasoning and decision making, and thus supplement the conventional modelling techniques. The present paper presents a neuro-fuzzy inference system for management of the Hirakud Reservoir on the River Mahanadi, in India, with the objectives of efficient flood control, irrigation and power generation. The objectives are considered as vaguely defined and hence are treated as fuzzy. The neuro-fuzzy inference system is used to capture the historical operation policy. The model developed is used to simulate the operation of reservoir and the performance of the reservoir is evaluated with reference to the identified fuzzy objectives. The performance of the model is found to be satisfactory and can be used as a rule curve for operating the reservoir.

Key words reservoir operation; soft computing techniques; neuro-fuzzy inference system