Data mining classification techniques in the development of the quantitative precipitation forecasting model during typhoon periods

陳莉,魏志強,徐訓新,游景雲,邱昌宏
Civil Engineering
Architecture
lichen@chu.edu.tw

Abstract

To provide the optimal real-time precipitations for operators on a reservoir flood-control system during typhoon, the methodology proposed can be used to extract a set of optimal rules for forecasting precipitation. The results obtained from the optimal quantitative precipitation forecast (QPF) model include the forecast of hourly rainfall during typhoon periods. The two classification technologies, namely decision-tree algorithm (C5.0) and regression method are employed in the extracting rules. The several steps involve collection of typhoon data, selection and classification of the typhoon patterns, building of the linear regression rainfall forecasting model, building of the C5.0 rainfall forecasting model, and evaluation and comparison of these two developed models. The collected data involve the precipitations at rainfall station and the typhoon real-time warning document issued by Central Weather Bureau (the content including the data of pressure in the typhoon center, position of typhoon center, the radius of typhoon, the predicted moving speed and direction, the center maximum wind speed, and the predicted typhoon path). The developed methodology can be applied to establish the real-time optimal QPF model in reservoir upstream rainfall gauges for the Shihmen reservoir in the Tanshui river basin.

Keyword：Typhoon; QPF; Decision tree; Regression; Prediction