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(54) Title: GENERATING A HYBRID SENSOR TO COMPENSATE FOR INTRUSIVE SAMPLING

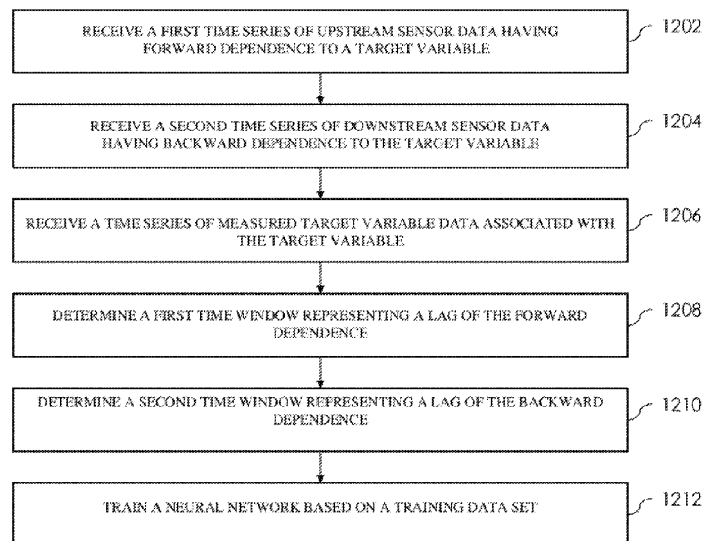


FIG. 12

(57) Abstract: A hybrid sensor can be generated by training a machine learning model, such as a neural network, based on a training data set. The training data set can include a first time series of upstream sensor data (504, 514, 702, 802) having forward dependence to a target variable (108, 110, 112, 604, 708, 804), a second time series of downstream sensor data (508, 518, 704, 806) having backward dependence to the target variable (108, 110, 112, 604, 708, 804) and a time series of measured target variable (108, 110, 112, 604, 708, 804) data associated with the target variable (108, 110, 112, 604, 708, 804). The target variable (108, 110, 112, 604, 708, 804) has measuring frequency which is lower than the measuring frequencies associated with the upstream sensor data (504, 514, 70, 802) and the downstream sensor data (508, 518, 704, 806). The hybrid sensor can estimate a value of the target variable (108, 110, 112, 604, 708, 804) at a given time, for example, during which no actual measured target variable (108, 110, 112, 604, 708, 804) value is available.

[Continued on next page]

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