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A Classification of Model Predictive Control Based on Photovoltaic Stations

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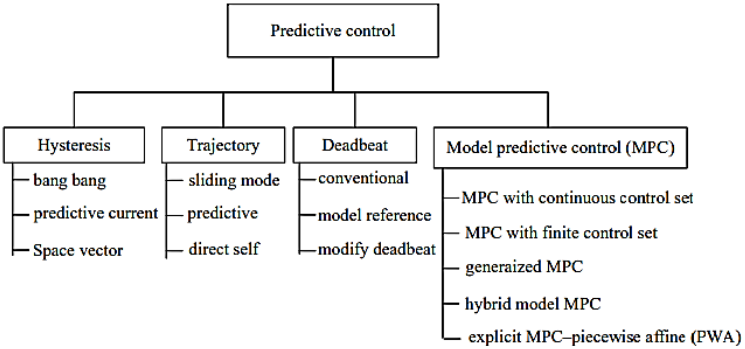
Classical controllers have been developed by linear controller combine with modulation schemes such as voltage oriented control, and direct power control. There are some drawbacks of these methods follow as a mismatch of nonlinear system with linear control, limitation of analogue control, computational time of controller. However, modern techniques have been developed for power converter controlled such fuzzy, neural, adaptive and predictive control. The latter control appears an attractive alternative for the control power converter due to its fast dynamic response. The main characteristic of predictive control is to use the model of system for prediction of controlled variables and selects the most appropriate control set based on optimality criterion. The classification of model predictive control is shown in Figure.



Classification of predictive control

The different approach called Model predictive control (MPC) has capable of predicting future output signals based on future input signals and initial values. A model of the system is considered in order to predict the future behaviour of the variables over a time period.

The model predicts the future dynamic behaviour of the system over a prediction horizon Tp. At each control interval an MPC algorithm attempts to optimize future plant behaviour by predicting a control horizon Tc . Only the first step of the control strategy from cost function optimization is implemented, then the plant state is sampled again and the calculations are repeated starting from the now current state, yielding a new control and new predicted state path.