

ABSTRACT

A new inductive learning algorithm, the Group Method of Data Handling for Parameters (GMDHPARAMS), is described. The algorithm derives new classification parameters while creating inductive learning rules based on these new classification parameters and the input parameters on which the derived parameters are based. GMDHPARAMS constructs a statistical learning network to store the best generated parameters along with the original input parameters. References to parameters are stored in the neurons of the statistical learning network and then used to build inductive rule set models. Layers are added to the statistical learning network as long as classification accuracy of the rule set models improves. GMDHPARAMS was used to automatically classify plasma states for a physical system that is important to nuclear fusion research. This algorithm was able to construct new derived parameters from input parameters and select from both the input parameters and derived parameters to accurately classify the plasma states. Such classifications are important because they can be used to automatically identify the plasma states of different physical conditions that occur in nuclear fusion plasmas.