

# Mapping Classifier Systems Into Neural Networks

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Abstract: Classifier systems are machine learning systems incorporating a genetic algorithm as the learning mechanism. Although they respond to inputs that neural networks can respond to, their internal structure, representation formalisms, and learning mechanisms differ markedly from those employed by neural network researchers in the same sorts of domains. As a result, one might conclude that these two types of machine learning formalisms are intrinsically different. This is one of two papers that, taken together, prove instead that classifier systems and neural networks are equivalent. In this paper, half of the equivalence is demonstrated through the description of a transformation procedure that will map classifier systems into neural networks that are isomorphic in behavior. Several alterations on the commonly-used paradigms employed by neural network researchers are required in order to make the transformation work. These alterations are noted and their appropriateness is discussed. The paper concludes with a discussion of the practical import of these results, and with comments on their extensibility.