

ABSTRACT

A tri-state neural network circuit 200 includes, in an intermediate layer: an input value X_i to which convolution is applied; a nonzero convolution operation circuit 21 configured to receive a weight W_i and to perform a convolution operation thereof; a sum circuit 22 configured to take a sum of operation values each subjected to the convolution operation and a bias W_0 ; and an activating function circuit 23 configured to convert a signal Y generated by taking the sum, using an activating function $f(u)$. The nonzero convolution operation circuit 21 is configured to skip a weight W_i having a zero weight and to perform a convolution operation based on a nonzero weight and an input value X_i corresponding thereto.

FIG. 4