A

PROJECT REPORT

ON

HARDWARE IMPLEMENTATION OF HOPFIELD NEURAL NETWORKS

SUBMITTED

BY

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CERTIFICATE

This is to certify that the project work entitled "**HARDWARE IMPLEMENTATION OF HOPFIELD NEURAL NETWORKS**" submitted to **CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY**, in partial fulfillment of the requirements for the award of degree of **B.E (Information Technology)** during the academic year 2017-2018 is a record of original work carried out by **Navya Sri Asmath (160114737017)** and **Neeharika Kompala (160114737018)** during the period of study inthe Dept. of IT, CBIT, Hyderabad.

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DECLARATION

We declare that the project work entitled **"HARDWARE IMPLEMENTATION OF HOPFIELD NEURAL NETWORK**" is being submitted by us to the Department of Information Technology, Chaitanya Bharathi Institute of Technology (A), affiliated to Osmania University, Hyderabad.

This is a record of bona-fide work carried out by us under the guidance and supervision of **Dr. Suresh Pabboju**, Professor ,Dept. of IT, CBIT.

No part of the thesis is copied from books/journals/internet and wherever a portion is taken, the same has been duly referred in the text. The report is based on the project work carried out entirely by us and not copied from any other source.

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ABSTRACT

The purpose of this thesis is to study and simulate the behavior of a biological neuron, how nervous impulses, the so-called spikes, are transmitted through the body of the neuron, from the dendrites to the axon. And with this knowledge, to emulate this behavior with the target getting a system, in VHDL, that works exactly in the same way that a biologic neuron. For it, it is important to know how, why and in what circumstances a neuron is fired.

From an electronic point of view dendrites of a neuron are considered as inputs, and the axon as an output. Nervous impulses are interpreted as electrical signals. The artificial neuron will be used in other applications, so that, the codification of the program that emulates the neuron will have be extrapolated to other systems to get a complete neural network.

With the codification in VHDL of the artificial neuron a FPGA can be programmed for future applications of computational neuroscience as well as artificial intelligence

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