Visvesvaraya Technological University, Belgaum -590018

A Project Report on

"Analog VLSI implementation of Artificial Neural Network"

Submitted in partial fulfillment of the requirement for the award of the degree
(Approved by KSCST, Bangalore)

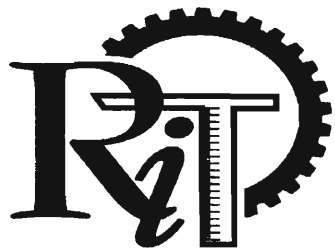
Bachelor of Engineering
In
Electronics & Communication Engineering

By

Harshitha D.	(4RA09EC012)
Madhumitha G. B.	(4RA09EC017)
Nandini B.N.	(4RA09EC022)
Sunil M.	(4RA10EC418)

Under the Guidance of

Mr. Vishwanath B. R.
Asst.Professor,
E&C Department,
R.I.T, Hassan



Department of Electronics & Communication Engineering
Rajeev Institute of Technology, Hassan-573201

2012-2013

ABSTRACT

To perform complex computations, adaption and learning in the way of biological systems, Artificial Neural Networks are the best known technique. These resulted in renewal of researches interested towards neural network and lead to implementation of different types of neural network. In this work we have developed Artificial Neural Network (ANN) architecture in analog VLSI platform at subthreshold region to perform signal amplification and frequency multiplication. The developed network design has an ability to adopted for digital operations like AND and OR. The implementation of the architecture requires multiplication, summation and neuron activation function. The proposed neural architecture is trained using back propagation algorithm in the analog domain using 180nm technology. The multiplier and adder block is implemented using Gilbert cell, and the neuron activation function is implemented using differential amplifier. The schematic and functionality of the proposed neural network architecture has been verified using cadence virtuoso tool.