

## DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING TEZPUR UNIVERSITY NAPAAM, TEZPUR – 784 028

## CERTIFICATE

This is to certify that the work presented in the report entitled **"A FLOW BASED ANOMALY DETECTION SYSTEM USING ENTROPY AND HOLT-WINTERS FORECASTING MODELS"** submitted in partial fulfillment of the requirement for the degree of Master of Computer Application (MCA), was carried out by Eliza Chelleng(CSM09039) and Purnima Pathak (CSM09037) under my supervision. The work has not been submitted to any other institute for the award of any other degree.

Date:09.06.2012 Place: Tezpur

Sanghametra Nath Internal Guide

Internal Guide Mrs. Sanghamitra Nath Assistant Professo**Assistant Professor** Dept. of CS & E<sub>Department</sub> of Computer Science & Engg. Tezpur University



## DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING TEZPUR UNIVERSITY NAPAAM, TEZPUR – 784 028

#### CERTIFICATE

This dissertation entitled "A FLOW BASED ANOMALY DETECTION SYSTEM USING ENTROPY AND HOLT-WINTERS FORECASTING MODELS" submitted by Eliza Chelleng (CSM09039) and Purnima Pathak (CSM09037) in partial fulfillment of the requirement for the degree of Master of Computer Application (MCA) of Tezpur University has been examined.

Internal E 5.20 Date: 40 Tezpur Tezpur Place Department st

External Examiner Date: .06,2012 Place:

# प्रगत संगणन विकास केन्द्र CENTRE FOR DEVELOPMENT OF ADVANCED COMPUTING



संचार एव सूचना प्राद्यागिका मंत्रालय का वेज्ञानिक संस्था, भारत संरकार A Scientific Society of the Ministry of Communications and Information Technology, Government of India 68, इलक्ट्रॉनिक्स सिटॉ, बॅगलूर - 560 100, भारत फ़ोन / Tel: +91-80-2852 3300, फैक्स / Fax - +91-80-2852 2590 68, Electronics City, Bangalore 560 100, India. www.cdacbangalore.in

16<sup>th</sup> May 2012

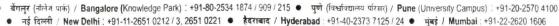
## To whomsoever concern

This is to certify that Ms. Eliza Chelleng, final year MCA, Department of Computer Science and Engineering, Tezpur University, Napaam, Tezpur-784028, Assam, has successfully completed her internship at C-DAC, Electronics City, Bangalore during January 2012 till May 2012. She was directly reporting to Mr.Muraleedharan who was coordinating her work during this period.

She carried out research in the field of anomaly detection for identifying intrusions and her specific contribution was in devising, implementing and validating an anomaly detection system based on Entropy and Holt-Winter models using Flow data. Her work is commendable and has further research potential.

N. Livono

Subramanian N Joint Director (Network Security)



मेंद्र 14 लगा / New Deint : +91-11-2051 02/27 3, 2051 0221 • हदराबाद / hyderabad : +91-40-2373 / 1257 24 • मुंबई / Mumbal : +91-22-2620 100
चेन्नई / Chennai : +91-044-2254 2226/27 • कोलकाता / Kolkata : +91-33-2357 9846 / 5989 / 3581 • मोहाली / Mohali : +91-172-223 7052-57

नॉयडा / Noida +91-120-240 2551 / 60 जिरुवनंतप्रम / Thiruvananthapuram +91-471-272 3333

# प्रगत संगणन विकास केन्द्र CENTRE FOR DEVELOPMENT OF ADVANCED COMPUTING



सचार एव सूचना प्रांद्यांगिका मत्रालय का वर्ज्ञानिक संस्था, भारत सरकार A Scientific Society of the Ministry of Communications and Information Technology, Government of India 68, इलक्ट्रॉनिक्स सिटां, बॅगलूर - 560 100, भारत फ़ोन / Tel: +91-80-2852 3300 फेक्स / Fax -+91-80-2852 2590 68 Electronics City, Bangalore 560 100, India www.cdacbangalore in

16<sup>th</sup> May 2012

#### To whomsoever concern

This is to certify that Ms. Purnima Pathak, final year MCA, Department of Computer Science and Engineering, Tezpur University, Napaam, Tezpur-784028, Assam, has successfully completed her internship at C-DAC, Electronics City, Bangalore during January 2012 till May 2012. She was directly reporting to Mr.Muraleedharan who was coordinating her work during this period.

She carried out research in the field of anomaly detection for identifying intrusions and her specific contribution was in devising, implementing and validating an anomaly detection system based on Entropy and Holt-Winter models using Flow data. Her work is commendable and has further research potential.

-CAMP

v ann

Subramanian N Joint Director (Network Security)

# Acknowledgements

In completion of this project and dissertation work entitled "Flow based Anomaly Detection using Entropy and Holt-Winter Forecasting Technique", we share a thought of giving an ovation to all the people for their support, valuable and guidance that has helped us carrying out this work.

At the very outset we would like to acknowledge our sincere thanks to our external guide Muraleedharan N, Senior Technical officer at Centre for Development of Advanced Computing (Bangalore), for his unique insight and warm guidance. He has always been encouraging and enthusiastic and it has been a genuine pleasure working with him.

We would like to show our thankfulness to Mr. Subramanian N, Joint Director, CDAC (Bangalore), and Prof. Syamanta M Hazarika, Professor, Tezpur University, for their consistent support and guidance for carrying out the project.

We would like to take the opportunity to express our deep sense of gratitude to Mr. Rahul Kumar, Project Engineer(CDAC), for helping us through out the project and also the entire CDAC staff for being cooperative during our stay at CDAC.

Finally we would like to thank Mrs. Sanghamitra Nath, Assistant Professor, Tezpur University and all our classmates for their valuable help and mental support throughout the period.