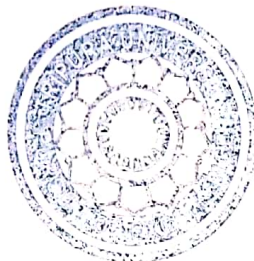


**Dr. Mrinal Kanti Bhowmik**  
Assistant Professor,  
Computer Science and Engineering  
Department Tripura University (A  
Central University) Suryamaninagar –  
799022, Tripura, India

Email:  
[mrinalkantibhowmik@tripurauniv.in](mailto:mrinalkantibhowmik@tripurauniv.in)  
[mkb\\_cse@yahoo.co.in](mailto:mkb_cse@yahoo.co.in)  
[ml.b.cse@gmail.com](mailto:ml.b.cse@gmail.com)  
Fax No: 0381-237-4802  
Phone No. 9436129933



Tripura University (A Central University)  
Suryamaninagar, Tripura, India

Date: 25.09.2020

## Approval Sheet

The thesis/ dissertation/ report entitled “Automatic Classification of Different types of Sedimentary rocks & Detection of Oil Reservoir” by Mr. Subhrajit Naha & Mr. Akash Datta is approved for accomplishment of degree of Master of Technology in Computer Science and Engineering.

*Mrinal Kanti Bhowmik*

.....  
Dr. Mrinal Kanti Bhowmik Supervisor,  
Head In-Charge and Assistant Professor,  
Computer Science and Engineering Department  
Tripura University (A Central University)  
Suryamaninagar – 799022, Tripura, India

*Pant*

.....  
External Examiner:

Date:

Place:

IV

**Dr. Mrinal Kanti Bhowmik**

Assistant Professor,  
Computer Science and Engineering Department  
Tripura University (A Central University)  
Suryamaninagar – 799022, Tripura, India

Email: - [mrinalkantibhowmik@tripurauniv.in](mailto:mrinalkantibhowmik@tripurauniv.in)  
[mkb\\_cse@yahoo.co.in](mailto:mkb_cse@yahoo.co.in)  
[mkb.cse@gmail.com](mailto:mkb.cse@gmail.com)  
Fax No: 0381-237-4802  
Phone No: 9436129933



Tripura University  
(A Central University)  
Suryamaninagar, Tripura, India

Date: 25.09.20

### Approval Sheet

The thesis/ dissertation/ report entitled “A Comprehensive Study on Segmentation of Carotid Artery for Prediction of Cardiovascular Disease” by Smt. Tania Bhattacharya is approved for accomplishment of degree of Master of Technology in Computer Science and Engineering.

*Mrinal Kanti Bhowmik*

(Dr. Mrinal Kanti Bhowmik)

Supervisor,  
Head In-Charge and Assistant Professor,  
Computer Science and Engineering Department  
Tripura University (A Central University)  
Suryamaninagar – 799022, Tripura,  
India

*Pant*

External Examiner

Date:

Place:

**Dr. Mrinal Kanti Bhowmik**  
Assistant Professor,  
Computer Science and Engineering Department  
Tripura University (A Central University)  
Suryamaninagar – 799022, Tripura, India

Email: mrinalkantibhowmik@tripurauniv.in  
mkb\_cse@yahoo.co.in  
mkb.cse@gmail.com  
Fax No: +91-381-237-4802  
Phone No: +91-9436129933



**Tripura University**  
**(A Central University)**  
**Suryamaninagar, Tripura, India**

Date: 25.09.20

## Approval Sheet

The thesis/ dissertation/ report entitled “A Study on Infrared Imaging Based Classification of Bruises in Fruits using Convolutional Neural Networks (CNNs)” by Mr. Sudipta De is approved for accomplishment of degree of Master of Technology in Computer Science and Engineering.

*Mrinal Kanti Bhowmik*

.....  
(Dr. Mrinal Kanti Bhowmik)  
Supervisor, Head In-Charge and Assistant Professor,  
Department of Computer Science and Engineering  
Tripura University (A Central University)  
Suryamaninagar – 799022, Tripura (W), India

*Ant*

.....  
External Examiner

Date:

Place:

**Dr. Mrinal Kanti Bhowmik**  
Assistant Professor,  
Computer Science and Engineering Department  
Tripura University (A Central University)  
Suryamaninagar – 799022, Tripura, India

Email: [mrinalkantibhowmik@tripurauniv.in](mailto:mrinalkantibhowmik@tripurauniv.in)  
[mkb\\_cse@yahoo.co.in](mailto:mkb_cse@yahoo.co.in)  
[mkb.cse@gmail.com](mailto:mkb.cse@gmail.com)  
Fax No: +91-381-237-4802  
Phone No: +91-9436129933



**Tripura University**  
**(A Central University)**  
**Suryamaninagar, Tripura, India**

Date: 25.09.20

## Approval Sheet

The thesis/ dissertation/ report entitled “A Comprehensive Study on Diabetic Foot Ulcer Detection methods using different Imaging Modalities” by Smt. Kuheli Majumder is approved for accomplishment of degree of Master of Technology in Computer Science and Engineering.

*Mrinal Kanti Bhowmik.*

.....  
(Dr. Mrinal Kanti Bhowmik)  
Supervisor, Head In-Charge and Assistant Professor,  
Department of Computer Science and Engineering  
Tripura University (A Central University)  
Suryamaninagar – 799022, Tripura (W), India

*PK*

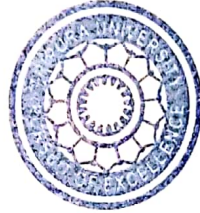
.....  
External Examiner

Date:

Place:

**Dr. Mrinal Kanti Bhowmik**  
Assistant Professor,  
Computer Science and Engineering Department  
Tripura University (A Central University)  
Suryamaninagar – 799022, Tripura, India

Email: mrinalkantibhowmik@tripurauniv.in  
mkb\_cse@yahoo.co.in  
mkb.cse@gmail.com  
Fax No: +91-381-237-4802  
Phone No: +91-9436129933



**Tripura University**  
**(A Central University)**  
**Suryamaninagar, Tripura, India**

Date: 25.09.2020

## Approval Sheet

The thesis/ dissertation/ report entitled “A Study on Different Microscopic Cell Imaging Modalities and Analysis of Pap-smear Images for Cervical Abnormality Detection” by Smt. Suyeta Das is approved for accomplishment of degree of Master of Technology in Computer Science and Engineering.

*Mrinal Kanti Bhowmik.*

.....  
(Dr. Mrinal Kanti Bhowmik)  
Supervisor, Head In-Charge and Assistant Professor,  
Department of Computer Science and Engineering  
Tripura University (A Central University)  
Suryamaninagar – 799022, Tripura (W), India

*Pat*

.....  
External Examiner  
Date:  
Place:

**Dr. Mrinal Kanti Bhowmik**  
Assistant Professor,  
Computer Science and Engineering  
Department Tripura University (A  
Central University) Suryamaninagar –  
799022, Tripura, India

Email:  
[mrinalkantibhowmik@tripurauniv.in](mailto:mrinalkantibhowmik@tripurauniv.in)  
[mkb\\_cse@yahoo.co.in](mailto:mkb_cse@yahoo.co.in)  
[mkb.cse@gmail.com](mailto:mkb.cse@gmail.com)  
Fax No: 0381-237-4802  
Phone No: 9436129933



**Tripura University (A Central University)**  
Suryamaninagar, Tripura, India

Date: 25.09.20.

## Approval Sheet

The thesis/ dissertation/ report entitled “Deep Learning for Automatic Weapon detection: A Survey” by Smt. Puja Bardhan is approved for accomplishment of degree of Master of Technology in Computer Science and Engineering.

*Mrinal Kanti Bhowmik*  
.....  
Dr. Mrinal Kanti Bhowmik Supervisor,  
Head In-Charge and Assistant Professor,  
Computer Science and Engineering Department  
Tripura University (A Central University)  
Suryamaninagar – 799022, Tripura, India

*25.09.2020*

.....  
External Examiner:

Date:  
Place:

III

**Dr. Mrinal Kanti Bhowmik**  
Assistant Professor,  
Computer Science and Engineering Department  
Tripura University (A Central University)  
Suryamaninagar – 799022, Tripura, India

Email: mrinalkantibhowmik@tripurauniv.in  
mkb\_cse@yahoo.co.in  
mkb.cse@gmail.com  
Fax No: +91-381-237-4802  
Phone No: +91-9436129933



**Tripura University**  
**(A Central University)**  
**Suryamaninagar, Tripura, India**

Date: 25.09.20

## Approval Sheet

The thesis/ dissertation/ report entitled “Asymmetric Analysis for Quality Inspection of Bruises in Fruits using Infrared Imaging” by Smt. Rudrani De is approved for accomplishment of degree of Master of Technology in Computer Science and Engineering.

*Mrinal Kanti Bhowmik*

.....  
(Dr. Mrinal Kanti Bhowmik)  
Supervisor, Head In-Charge and Assistant Professor,  
Department of Computer Science and Engineering  
Tripura University (A Central University)  
Suryamaninagar – 799022, Tripura (W), India

.....  
External Examiner

Date:

Place:

II

**Dr. Mrinal Kanti Bhowmik.**  
Assistant professor  
Computer Science & Engineering Department.  
Tripura University ( A Central  
University). Suryamaninagar, 799022, Tripura, India.

Email: [mrinalkantibhowmik@tripurauniv.in](mailto:mrinalkantibhowmik@tripurauniv.in)  
[mkb\\_cse@yahoo.co.in](mailto:mkb_cse@yahoo.co.in)  
[mkb.cse@gmail.com](mailto:mkb.cse@gmail.com)  
Fax No: 0381-237-4802  
Phone No: 9436129933



**Tripura University**  
**( A Central University)**  
**Suryamaninagar, Tripura, Agartala**

## Approval Sheet

The thesis/ dissertation/ report entitled “**Automatic Detection of a Deceptive Face Using Thermal Imaging**” by Smt. Sanhita Dasgupta is approved for accomplishment of degree of Master of Technology in Computer Science and Engineering.

*Mrinal Kanti Bhowmik.*  
.....

Dr. Mrinal Kanti Bhowmik.  
Supervisor,  
Head In-Charge and Assistant Professor.  
Computer Science & Engineering Department.  
Tripura University ( A Central University).  
Suryamaninagar, 799022, Tripura, India

*Prant*  
.....

External Examiner

Date: 25.09.20

Place: TU,



## Approval Sheet

The report entitled "Energy efficient heart rate monitoring system using IoT platform" by Medha Roy Sarkar is approved for M.Tech 4<sup>th</sup> semester examination, 2020 (subject code: CSE 1201C PR) in Computer Science and Engineering.

Examiner(s):

*Prat*

*Abhishek Majumder*  
*01.09.2020*

Signature of Supervisor  
(Dr. Abhishek Majumder)  
Assistant Professor  
Department of Computer Science and Engineering  
Tripura University (A Central University)  
Suryamaninagar – 799022, Tripura, India

*Dr. Mrinal Kanti Bhowmik*  
*01.09.2020*

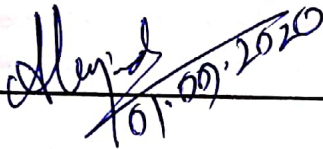
Signature of Head-of-Department  
(Dr. Mrinal Kanti Bhowmik)  
Co-ordinator of the Department  
Department of Computer Science and Engineering  
Tripura University (A Central University)  
Suryamaninagar – 799022, Tripura, India

## Approval Sheet

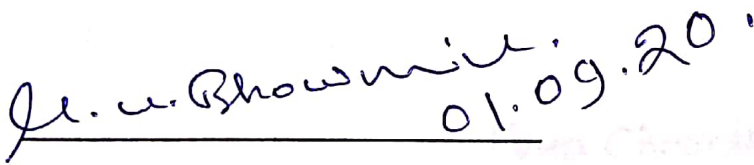
The thesis entitled "Shilling Attack Detection in Collaborative Filtering Recommender Systems by Ward<sub>p</sub> method" by Keya Chowdhury is approved for M.Tech 4<sup>th</sup> semester examination, 2020 (subject code: CSE 1201C PR) in Computer Science and Engineering.

Examiner(s):

Pzt

  
01.09.2020

Signature of Supervisor  
(Dr. Abhishek Majumder)  
Assistant Professor  
Department of Computer Science and Engineering  
Tripura University (A Central University)  
Suryamaninagar – 799022, Tripura, India

  
01.09.2020

Signature of Head-of-Department  
(Dr. Mrinal Kanti Bhowmik)  
H.O.D of the Department  
Department of Computer Science and Engineering  
Tripura University (A Central University)  
Suryamaninagar – 799022, Tripura, India

# Tripura University

(A Central University)

Suryamaninagar-799022

## Provisional Certificate

*This is to Certify that Shawli Bardhan has qualified for the Degree of Doctor of Philosophy (Ph.D.) in Computer Science & Engineering under the Faculty of Science in accordance with UGC Regulations-2009 as on 19.11.2019.*

The degree will be conferred on her at the next Annual Convocation of the University.

Title of the Thesis : "Analysis of IR Images for Detection of Inflammatory Knee Joint Diseases".

**Place :** Suryamaninagar

**Date :** 20/11/2019

*Satyajit Poddar*

**(Prof. S. Poddar)**

Controller of Examinations(I/C)

Tripura University



त्रिपुरा विश्वविद्यालय  
Tripura University  
(केंद्रीय विश्वविद्यालय)  
(A Central University)  
सूर्यमणिनगर-799022  
Suryamaninagar-799022

Sl. No. PC/Ph.D./0446/2020


Date: 14.09.2020

## Provisional Certificate

This is to Certify that **Usha Rani Gogoi** vide registration No.F/TU/COE/Ph.D/10/CSE/06/16 has qualified for the **Degree of Doctor of Philosophy (Ph.D.) in Computer Science & Engineering** under the Faculty of **Science** on **10.09.2020** after successful completion of Course work in accordance with UGC Regulations-2009.

The degree will be conferred on her at the next Convocation of the University.

Title of the Thesis: **Analysis of Infrared Breast Thermograms for Abnormality Detection.**

  
14/09/2020  
(Prof. Chinmoy Roy)

Controller of Examinations (I/C)  
(Prof. CHINMOY ROY)  
Controller of Examinations (I/C)  
Tripura University.

त्रिपुरा विश्वविद्यालय  
TRIPURA UNIVERSITY

(केन्द्रीय विश्वविद्यालय)  
(A CENTRAL UNIVERSITY)

सूर्यमणिनगर, अगरतला, त्रिपुरा, भारत  
Suryamaninagar, Agartala, Tripura, INDIA  
पिन Pin - 799022



फोन Phone: (0381) 237 4801  
237 9002  
237 9003  
237 9004  
237 9024

फैक्स Fax : (0381) 237 4802  
237 4803  
237 5355  
237 4804

e-mail : tuoffice@tripurauniv.in  
website : www.tripurauniv.in

Ref. No.: F/TU/COE/Ph.D/10/CSE/03/15

Date: 06/11/2020

**TO WHOM IT MAY CONCERN**

*This is to certify that Ms. Kakali Das, Ph.D research scholar, Department of Computer Science & Engineering, Tripura University (A Central University) with Registration No. F/TU/COE/Ph.D/10/CSE/03/15, Date of Registration: 18.11.2015, has submitted her Ph.D Thesis in Computer Science & Engineering Department on 21<sup>st</sup> September, 2020 under the supervision of Dr. Mrinal Kanti Bhowmik, Assistant Professor, Department of Computer Science & Engineering, Tripura University (A Central University) and Co-supervision of Prof. Barin Kumar De (Retired), Department of Physics, Tripura University (A Central University).*

*SB*  
*06/11/2020*

(Professor S. Banik)

Dean

Faculty of Science

Tripura University (A Central University)

संकायिका/Dean

विज्ञान संकाय

Faculty of Science

त्रिपुरा विश्वविद्यालय

Tripura University

त्रिपुरा विश्वविद्यालय

TRIPURA UNIVERSITY

(केन्द्रीय विश्वविद्यालय)  
(A CENTRAL UNIVERSITY)

सूर्यमणिनगर, अगरतला, त्रिपुरा, भारत  
Suryamaninagar, Agartala, Tripura, INDIA  
पिन Pin - 799022



फोन Phone: (0381) 237 4801  
237 9002  
237 9003  
237 9004  
237 9024

फैक्स Fax : (0381) 237 4802  
237 4803  
237 5355  
237 4804


e-mail : tuoffice@tripurauniv.in  
website : www.tripurauniv.in

Ref. No.: F/TU/COE/Ph.D/10/CSE/09/16

Date: 06/11/2020

**TO WHOM IT MAY CONCERN**

*This is to certify that Sri. Anu Singha, Ph.D research scholar, Department of Computer Science & Engineering, Tripura University (A Central University) with Registration No. Ph.D/10/CSE/09/16, Date of Registration: 30.11.2016, has submitted his Ph.D Thesis in Computer Science & Engineering Department on 30<sup>th</sup> September, 2020 under the supervision of Dr. Mrinal Kanti Bhowmik, Assistant Professor, Department of Computer Science & Engineering, Tripura University (A Central University).*

  
06/11/2020

(Professor S. Banik)

Dean

Faculty of Science

Tripura University (A Central University)

संकायाधक्षी/Dean

विज्ञान संकाय

Faculty of Science

त्रिपुरा विश्वविद्यालय

Tripura University