Kohat University of Science and Technology
Minute Sheet

Ref._____/IoC/Synopsis/ASR/23

September 6, 2023.

1. Subject: **Submission of Synopsis for the Upcoming ASRB**

This is in reference to the subject matter, find enclosed herewith the synopsis (fresh) of Mr. Asim Wadood, CS420212002, Ph.D. scholar, for the onward process.

Dr. Muhammad Altaf Khan
Assistant Professor/Coordinator Ph.D. IoC

2. <u>Director-IoC</u>

forwarded

3. <u>Dean, Faculty of Physical and Numerical Sciences:</u>

4. <u>Director ASR</u>

CHECKLIST FOR PhD SYNOPSIS

(FRESH)

Name of Scholar: Asim Wadood

Registration No: CS420212001

Discipline: Institute of Computing

S.NO	REQUIREMENTS	Remarks
1.	Covering letter duly Signed by the HoD	√
2.	Incorporation of observation form; observations raised by DGC (for fresh cases) or ASRB (for approved with changes / referred back / Rejected) duly signed by the supervisors and HoD	√
3	Approval of Course work	√
4.	Approval of Supervisor(s)	√
5.	Supervision Certificate (Number of scholars under the Supervision of supervisor–I)	√
6.	Clearance Certificate duly signed by the HoD and Finance Section	√
7.	Anti-Plagiarism Certificate issued by QEC	√
8.	KUST Ethical Approval Certificate (if any)	-
9.	Consent Letter (if Supervisor is from outside the KUST)	-
10.	Comprehensive Result	√
11.	Synopsis Form (Annexure-B duly signed by Supervisors and DGC members	√
12.	Complete Synopsis (Title Page duly Signed by Supervisors)	√

KOHAT UNIVERSITY OF SCIENCE & TECHNOLOGY

Kohat 26000, Khyber Pakhtunkhwa, Pakistan Ph # 0922-554563-554565, Fax #. 554556

Institute of Computing

CERTIFICATE REGARDING INCORPORATION OF OBSERVATIONS OF THE DGC

Scholar Name	Research Title	Observations raised by DGC in its meeting held on 22\08\2023	Action Taken	Remarks (if any)
Asim Wadood	**Unsupervised Deep Learning and Generative Adversarial Network Powered Augmentation for Enhanced Rare Event Detection**	1. The title may please be made shorter.	The Length of the title has been made shorter to 14 words.	
		2. The length of synopsis may please be made shorter.	The Length of the synopsis has been made shorter to 10 pages.	
		3. Problem Statement needs to be just one paragraph.	This observation is incorporated on page 2.	Refer to Page No. 2
		4. Rephrase objectives 1 and 2.	This observation is incorporated on page 3.	Refer to Page No. 3
		5. Change Problem Statement to student only and title also.	The problem statement and title remain unchanged as the purpose of the application is a general one, involving activities, abandoned baggage, camera tampering, and student behavior. The problem statement comprehensively addresses these aspects, and thus, it's advisable to retain it in its current form.	
		6. In second paragraph of Introduction correct the sentence "[3], [4], [5], [6], [7], [8], [9] are discussed by these methods."	The modifications have been integrated into the first page.	Refer to Page No. 1
		7. Mention only those augmentation techniques that will be used in your research.	This observation is incorporated on page 6.	Refer to Page No. 6
		8. In Figure 1, text size is too small.	This observation is incorporated on page 3.	Refer to Page No. 3

Dr M. Irfan Uddin

Name & Signature of Supervisor-I

Dr Muhammad Adnan

Name & Signature of Supervisor-II

Name & Signature of Supervisor-III

Date: 28 /8/ 2023.

Name & Signature of Departmental Graduate Committee:

1. Prof. Dr. Shafiullah Khan, IoC
   Convener/Director

2. Prof. Dr. Wali Khan Mashwani, INS
   Member

3. Prof. Dr. Muhammad Asif Jan, INS
   Member

4. Dr. Amjad Mahmoud, Associate Professor, IoC
   Member

5. Dr. Saima Hassan, Assistant Professor, IoC
   Member

6. Dr. M. Irfan Uddin, Assistant Professor, IoC
   Co-Opted Member

7. Dr. Muhammad Roman, Lecturer, IoC
   Member

8. Dr. M. Altaf Khan, Assistant Professor, IoC
   Secretary

Date: 28 /8/ 20)3.

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No.KUST/DASR/Fall-22/IoC/546

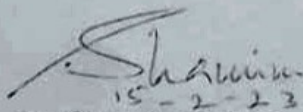February 22, 2023

The Director,
Institute of Computing,
KUST.

Subject: **APPROVAL OF COURSE WORK IN RESPECT OF ASIM WADOOD, PH.D., RESEARCH SCHOLAR IN COMPUTER SCIENCE**

Dear Sir,

Please refer to your reference No. 135/IoC dated 22.02.2023 regarding the subject matter; the following courses are approved duly recommended by the DGC in respect of Asim Wadood, Registration No. CS420212001, in your institute for the session 2021-23.

S.#	Course Code	Course Title	Specialized/ Elective/NC Courses	Cr.Hrs	Grade
1.	CS-661	Advance Machine Learning	Non-Credit	3.00	P
2.	CS-741	Advance Topics in Semantic Web	Elective	3.00	A-
3.	CS-769	Knowledge Based System Design	Elective	3.00	A-
4.	CS-542	Computer Vision	Non-Credit	3.00	P
5.	CS-863	Recommender Systems	Specialized	3.00	A-
6.	CS-866	Computational Intelligence	Elective	3.00	A-
7.	CS-766	Knowledge Representatio	Specialized	3.00	A-
8.	CS-868	Advance Information Retrieval	Specialized	3.00	A

The scholar scored (CGPA 3.73/4.00) as per Academic Regulations for Graduate Program and is now eligible to proceed to the next post of action desired.

Dr. Shamim Saleha
Director ASR, KUST
Copy to:
1. Vice Chancellor
2. Master File
3. Office File

No.KUST/DASR/Fall-22/IoC/ 503

February 1 2023

The Director,
Institute of Computing,
KUST

Subject: **APPROVAL OF SUPERVISORS**

Dear Sir,

The Competent Authority has approved the following faculty members to act as Supervisor and Co-supervisor in respect of the below-mentioned scholars:

NAME OF SCHOLAR	SUPERVISOR	CO-SUPERVISOR
Samina	Dr. Muhammad Irfan Uddin, Institute of Computing	Dr. Wali Khan Mashwani, Institute of Numerical Sciences
Sajid Ullah	Dr. Muhammad Irfan Uddin, Institute of Computing	Dr. Muhammad Adnan, Institute of Computing
Asim Wadood	Dr. Muhammad Irfan Uddin, Institute of Computing	Dr. Muhammad Adnan, Institute of Computing
Munir Hussain	Dr. Amjad Mahmood, Institute of Computing	Dr. Muhammad Altaf, Institute of Computing
Arsalan Farooq	Dr. Muhammad Irfan Uddin, Institute of Computing	Dr. Muhammad Adnan, Institute of Computing
Muhammad Karim	Dr. Muhammad Irfan Uddin, Institute of Computing	Dr. Muhammad Adnan, Institute of Computing
Shamsham Kiran	Dr. Amjad Mahmood, Institute of Computing	Dr. Muhammad Altaf, Institute of Computing
Abrar Khan	Dr. Amjad Mahmood, Institute of Computing	Dr. Muhammad Altaf, Institute of Computing

Note: The case of Ali Zeb will be processed subject to the provision of NOC for admission to Ph.D. Program.

15 - 2 - 23

Dr. Shamim Saleha
Director ASR, KUST

Copy to:
1. Director, Institute of Computing
2. Dr. Wali Khan Mashwani, Institute of Numerical Sciences
3. Dr. Muhammad Irfan Uddin, Institute of Computing
4. Dr. Muhammad Altaf, Institute of Computing
5. Dr. Muhammad Adnan, Institute of Computing
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KOHAT UNIVERSITY OF SCIENCE & TECHNOLOGY

Kohat 26000, Khyber Pakhtunkhwa, Pakistan   Ph# 0922-554563-554565, Fax# 554556

CERTIFICATE

Name of Supervisor: Dr. M. Irfan Uddin

Total number of students under supervision: 2

S. #	Name of Student	Degree Program (MS/MPhil/PhD)	Date and Meeting of Synopsis Approval	Current Status of Supervision (Research Semester)
1.	Muhammad Karim	MSCS	105th - April 10, 2023	Thesis
2.	Samina	PhD	106th - May 17, 2023	Thesis
3.				
4.				
5.				
6.				
7.				

Name & Signature of Departmental Graduate Committee:

1. Prof. Dr. Shafiullah Khan, IoC
   Convener/Director

2. Prof. Dr. Wali Khan Mashwani, INS
   Member

3. Prof. Dr. Muhammad Asif Jan, INS
   Member

4. Dr. Amjad Mahmoud, Associate Professor, IoC
   Member

5. Dr. Saima Hassan, Assistant Professor, IoC
   Member

6. Dr. M. Irfan Uddin, Assistant Professor, IoC
   Co-Opted Member

7. Dr. Muhammad Roman, Lecturer, IoC
   Member

8. Dr. M. Altaf Khan, Assistant Professor, IoC
   Secretary

Date: 22/8/23

4 (CS420212001)   28-Aug-2023

KOHAT UNIVERSITY OF SCIENCE & TECHNOLOGY
KOHAT

CLEARANCE CERTIFICATE   *Synopsis*

Purpose of Clearance:

Degree	Provisional	Transcript	Security University/ Hostel	Admission Cancellation	Thesis Submission

Name of Student: **ASIM WADOOD**

Father's Name: **ABDUL WADOOD**

Discipline: **PH.D (CS)**   Semester ___—___

Hostel Name (If Any) _____ Student Fee Slip ID No:_____

Office Use Only

Please report regarding his/ her outstanding books/ dues/ other thing (if any) of the above mentioned student.

Boarder	Dayscholar ✓	Hostel Name

_____   _____
Hostel Manager   **Provost Signature / Stamp**

✓ 1. Head of Department _____ *Shp* _____

2. Librarian_____

3. Director Academics / Admission Section_____

4. ENSC _____ 5. University Cafeteria_____

6. CDC _____ 7. Chief Proctor_____

8. Accounts Section:

Clear ✓	Outstanding

I. University Fee ✓
II. Hostel Fee

_____
Accountant Signature   **Stamp**

★ Please Collect your Cheque (If any) with in 03 Months. Other wise It well be considered Cancelled
((Note) Every Student has to present his / her 1st & last Admission Fee Slip / Hostel Fee
Slip   (Photo Copy will not be acceptable for University / Hostel Security)

Directorate of Quality Enhancement

No. **1027**/KUST/QEC/PC/23
Date: 28/08/2023

Anti-Plagiarism Test Certificate

(*Similarity Index Certificate*)

For M.Phil./MS/Ph.D Thesis/Synopsis

Name of Scholar:	ASIM WADOOD
Discipline (M.Phil./MS/Ph.D.):	PhD
Department/Institute:	INSTITUTE OF COMPUTING
Title of Synopsis/Thesis:	UNSUPERVISED DEEP LEARNING AND GENERATIVE ADVERSARIAL NETWORK POWERED AUGMENTATION FOR ENHANCED RARE EVENT DETECTION
Document Type (Synopsis/Thesis)	Synopsis
Words Count	4529
Name and Designation of Supervisor	DR. M. IRFAN UDDIN, ASSOCIATE PROFESSOR, INSTITUTE OF COMPUTING, KUST
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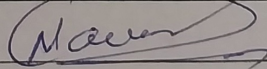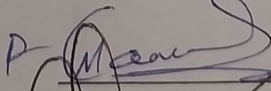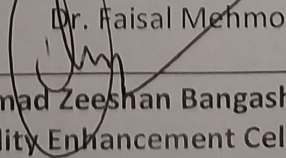
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Naimat Khan, **Office Assistant**

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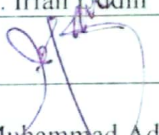
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Unsupervised Deep Learning and Generative Adv... By Asim Wadood

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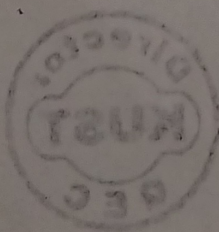
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KUST/Exam/Sem/No. 1067

Dated: August 11, 2023

Notification No: PhD-IOC/Comprehensive-Exam/May-2023

The Comprehensive Examination Result in respect of the following PhD Scholar in the discipline of Computer Science, duly approved by the Vice Chancellor, is notified as under:

Reg. No	Name	%age of Marks Obtained	Result	Attempt No.	Semester During Which Current Attempt Made
CS420212001	Asim Wadood	73.00	Pass	1st	Spring-2023

Result Declared on: August 11, 2023
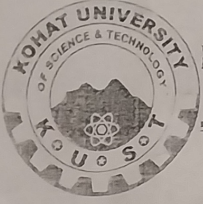
Controller of Examinations
KUST

Copy to:
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2. Director Advance Studies & Research
3. Director Institute of Computing
4. Scholars' files
5. Office copy

KOHAT UNIVERSITY OF SCIENCE & TECHNOLOGY

Kohat 26000, Khyber Pakhtunkhwa, Pakistan   Ph# 0922-554563-554565, Fax# 554556

SYNOPSIS FORM

1. **Research Topic:**

   Unsupervised Deep Learning and Generative Adversarial Network Powered Augmentation

   for Enhanced Rare Event Detection
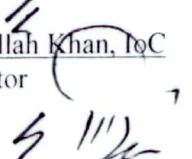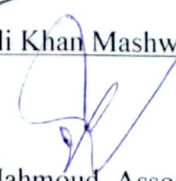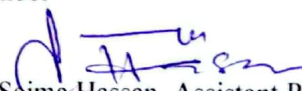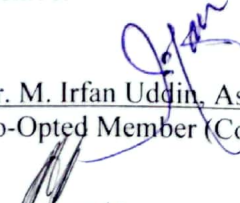
2. **Scholar:**

Name	Asim Wadood
Registration No	CS420212001
Department/ Institute/ Centre	Institute of Computing
Date of Admission	/ /2021

3. **Supervisors:**

Name of Supervisor I:	Dr. M. Irfan Uddin
Signature:	
Name of Supervisor II:	Dr. Muhammad Adnan
Signature:	
Name of Supervisor III (if any):	
Signature:	

Name & Signature of Departmental Graduate Committee:

1. Prof. Dr. Shafiullah Khan, IoC
   Convener/Director

2. Prof. Dr. Wali Khan Mashwani, INS
   Member

3. Prof. Dr. Muhammad Asif Jan, INS
   Member

4. Dr. Amjad Mahmoud, Associate Professor, IoC
   Member

5. Dr. Saima Hassan, Assistant Professor, IoC
   Member

6. Dr. M. Irfan Uddin, Assistant Professor, IoC
   Co-Opted Member (Coordinator MS)

7. Dr. Muhammad Roman, Lecturer, IoC
   Member

8. Dr. M. Altaf Khan, Assistant Professor, IoC
   Secretary DGC

Date: _____

Unsupervised Deep Learning and Generative Adversarial Network Powered Augmentation for Enhanced Rare Event Detection

by

Asim Wadood

(Reg. No: CS420212001)

Supervisor-I	Dr. M. Irfan Uddin	IOC, KUST	
			Signature
Supervisor-II	Dr. Muhammad Adnan	IOC, KUST	
			Signature
Director	Dr. Shafiullah Khan	IOC, KUST	
			Signature
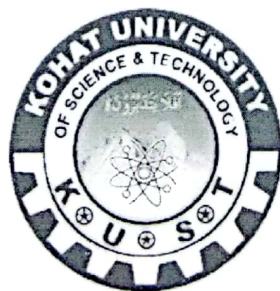
Institute of Computing
Kohat University of Science & Technology, Kohat-26000,

Introduction

The detection of rare events holds immense importance across various sectors, including indus-

metro station safety. Huang et al. [4] developed TCC-Net using deep contrastive self-supervised

learning. Minh N et al. [5] predicted rare actions using GANs, while, in the realm of steel surface

Objectives

training data

testing data

F

T
To

is a comprehensive model designed to address the challenge of generating coherent and realis-

$$\mathcal{L}_{G_t} = \mathbb{E}_{z \sim p_{z_t}}[D_t(G_t(z_t))] + \lambda_{\text{div}} \ldots \text{KL}(p_{g_t}||p_{x_t}) + \lambda_{\text{MMD}} \cdot \text{MMD} \tag{2}$$

In Equation (2) where P_{z_t} represents the distribution of noise input z_t, $D_t(G_t(z_t))$:denotes the

In Equation (6) where $\lambda_{\text{diversity}}$ controls the strength of the diversity penalty, P_{real_s} is the distri-

Algorithm 1 DA-WGAN with Temporal and Spatial, research proposed algorithm. Research
w

In

In

our approach incorporates pose variations, occlusion simulation, object insertion, lighting changes,

viewpoint alterations, temporal shifts, clothing modifications, facial expression manipulation, and
b
b

[2] B. Murugan, M. Elhoseny, K. Shankar, and J. Uthayakumar, "Region-based scalable smart system for anomaly

International Conference on Pattern Recognition, vol. 2002, pp. 435–438 vol.1.

[21] J. Kooij, M. Liem, J. Krijnders, T. Andringa, and D. Gavrila, "Multi-modal human aggression detection,"

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