

# National Testing Service - Pakistan

**Building Standards in Educational and Professional Testing** 

# Kohat University of Science & Technology, Kohat (Admission Test)

Test Held on: Wednesday. 28th August 2019

## (Result)

earch Resu	at for the keyword " 332	02-5648870-5 "	CMC	Subject / Category	NTS Marks
	Name	Father Name	3,0,00		66
100049	ARSLAN FAROOD	TARIQ MAHMOOD SHAH	33202-5548870-5	GAT-A	

Current Date / Time: Thursday 27th, February 2020 , 02: 22:03 PM



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

No.KUST/DASR/Fall-22/loC/

February 15, 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 Mas wani Institute of Numerical Sciences
Sajid Ullah	Dr. Muhammad Irfan Uddin, Institute of Computing	Institute of Computing
Asim Wadood	Dr. Muhammad Irfan Uddin, Institute of Computing	Dr. Muhammad Idnan Institute of Computing
Munir Plussain	Dr. Amjad Mahmood, Institute of Computing	Dr. Muhammad Altaf, Institute of Computing
Arsalan Farooq	Dr. Muhammad Irfan Uddin, Institute of Computing	Dr. Muhammad Adnar Institute of Computing
Muhammad Karim	Dr. Muhammad Irfan Uddin, Institute of Computing	Dr. Muhammad Adnar Institute of Computing
Shamsham Kiran	Dr. Amjad Mahmood, Institute of Computing	Dr. Muhammad Altaf, Institut of Computing
Abrar Khan	Dr. Amjad Mahmood, Institute of Computing	Dr. Muhammad Altaf, listitut of Computing

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

Dr. Shamim Saleha Director ASR, KUST

Copy to:

1. Director, Institute of Computing

2. Dr. Wali Khan Mashwani, Institute of Numerical Sciences

Dr. Muhammad Irfan Uddin, Institute of Computing

4. Dr. Muhammad Altaf, Institute of Computing

5. Dr. Muhammad Adnan, institute of Computing

6. Master File

7. Office File



Kohat 26000, Khyber Pakhtunkhwa, Pakistan Ph # 0922-554563-554565, Fax #. 554566

No.KUST/DASR/Fall-22/IoC/ 497

February 14, 2023

The Director, Institute of Computing, KUST.

Subject:

APPROVAL OF COURSE WORK IN RESPECT OF ARSALAN FAROOO, MSDS RESEARCH SCHOLAR IN DATA SCIENCE

Dear Sir.

Please refer to your letter No. 97/KUST/loC/AS&R/23 dated 09.02 2023 regarding the subject matter; the following courses are approved duly recommended by the DGC in respect of Arsalan Farooq, Registration No. DS320192002, in your institute for the session 2019-20.

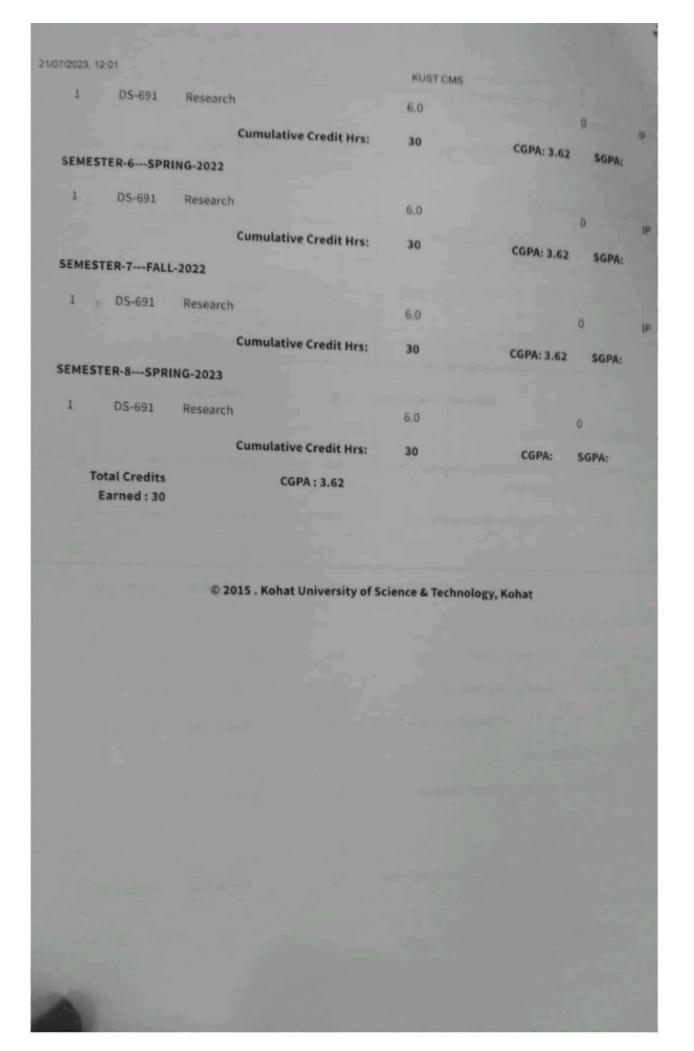
S.#	Course Code	Course Title	Core/Specialized / Elective Courses	Cr.Hrs	Grade
1.	DS-501	Tools and Techniques for Data Science	Compulsory	3.00	B+
2.	DS-502	Statistical and Mathematical Methods for Data Analysis	Compulsory	3.00	A
3.	DS-505	Deep Learning	Specialized	3.00	A-
4.	CS-565	Advanced Natural Language Processing	Specialized	3.00	В
5.	CS-661	Advance Machine Learning	Specialized	3.00	A
6.	CS-662	Advanced Artificial Neural Network Networks	Elective	3.00	B+
7.	CS-564	Evolutionary Computing	Elective	3.00	A-
8	CS-668	Advanced Information Retrieval	Elective	3.00	В

The scholar scored (CGPA 3.62/4.00) as per Academic Regulations for Graduate Program and is now eligible to proceed to the next post of action desired.

Dr. Shamim Salcha Director ASR, KUST Copy to:

- 1. Vice Chancellor
- 2. Master File
- 3. Office File

3,1201			KUST CMS			
egNo		D5320192002				
tudent N	ame	Arslan Farooq				
egree Pr	ogram	MS-DS-IIT-KUST				
			- 414	Percentage	Grade	Grade
	Course	Course Title	Credit	Percentage	Points	
	Code		Hours			
SEMESTE	R-1FALL-	2019			3.42	B+
1	CS-662	Advance Artificial Neural	3.0	79.25		
-		Networks				
			3.0	80.30	3.5	B+
2	DS-501	Tools and Techniques for Data	3.0			
		Science			4	A
		Statistical and Mathematical	3.0	86.02		
3	05-502	Methods for Data Analysis				
				GPA: 3.6	4 SGPA: 3	.64
		Semester Credit Hrs:	9			
SEME	STER-2SP	RING-2020		72.00	2.83	B-
1	CS-565	Advance Natural Language	3.0	72.00		
		Processing				
		surviviant exercises	3.0	90.00	4	A
2	CS-661	Advance Machine Learning			2.67	A-
	DS-505	Deep Learning	3.0	82.00	3.67	
3	55311		18	CGPA: 3	.57 SGPA	: 3.5
		Cumulative Credit Hrs:				
esu	ESTER-3F	ALL-2020				
367			3.0	85.25	3.92	A-
1	C5-564	Evolutionary Computing	3.0			
	CS-66	a Advance Information Retrieval	3.0	76.00	3.17	В
2	C3-99			cons	ec con	: 3.55
		Cumulative Credit Hrs	: 24	CGPA:	3.56 SUPA	. 3.33
	WESTER A	SPRING-2021				
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	CS-56		3.0	77.00	3.25	В
		Processing				
	2 DS-6	91 Research	6.0		0	IP
	2 DS-6	21 Nesesitii				
		Cumulative Credit Hr	s: 30	CGPA:	3.62 SGP	A: 3.25
- ET - C	EMESTER-5-	-FALL-2021				
	LACSTER-S-	77.274.				
	Total Cr					
	Earned	1:30				
-	ALEXANDER DATE OF	Student Transcript.				



- 4. Replace verb "find" with any other appropriate verb either in objective # 2 or
- 5. Add numbers to equations in proposed methodology.
- 6. In first paragraph of methodology types of topological indices have been mentioned and compared that are usually written in introduction. Only last paragraph in methodology presents some idea of proposed methodology. Revise methodology by writing a short descriptive text methods/steps/approaches that will be used to conduct proposed research (use future tense).
  - 7. Correct referencing errors.
  - 8. Replace "research plan" subheading with "time frame"

#### Agenda Item No.18.2

Muhammad Irfan, M.Phil. Scholar in Mathematics (Reg. # MT320211006)

#### Research Title: Approved

A STUDY ON THE GENERALIZATIONS OF COMPLEX CUBIC FUZZY INFORMATION

#### Supervisor-I

Dr. Israr Ali Khan, Institute of Numerical Sciences, KUST

#### Supervisor-II

Dr. Sami Ullah Khan. Institute of Numerical Sciences, Gomal University, D.I.Khan

#### RESEARCH PROPOSAL: Approved with changes

Decision: Submit a revised synopsis to the Directorate of ASR after incorporating the suggestions/modifications pointed out by the Board as given below:

- 1. Do correction for text line spacing and font size as per KUST format.
- 2. Correct grammar mistakes in whole synopsis
- 3. Rephrase first line in first paragraph of introduction for more clarity and correction. In addition, add citation for fuzzy sets.
- 4. Add numbers to equations in proposed methodology.
- 5. Delete a statement regarding goals under subheading "objectives"
- 6. Correct referencing errors.
- 7. Replace "research plane" subheading with 'time frame'

MS Synopses in Data Science/ Computer Science

#### Agenda Item No.19.A.1

Arsalan Farooq, MS Scholar in Data Science (Reg. # DS320192002)

#### Research Title: Approved

INTERPRETABLE MULTI-HORIZON TIME SERIES FORECASTING OF CRYPTOCURRENCIES BY LEVERAGE TEMPORAL FUSION

#### Supervisor-I

Dr. Muhammad Irfan Uddin. Institute of Computing, KUST

#### Supervisor-II:

Dr. Muhammad Adnan. Institute of Computing, KUST

#### RESEARCH PROPOSAL: Approved with changes

Decision: Submit a revised synopsis to the Directorate of ASR after incorporating the suggestions/modifications pointed out by the Board as given below:

1. Introduction is lengthy, reduce it.

Page | 12

Proceeding of Advance Studies & Research Board held on March 17, 2023

- Add citations in first paragraph of introduction.
- Do correction for text line spacing and font size as per KUST format.
- Change numbers with bullets by separating research questions and objectives.
- Do corrections of personalized terms such as "we" in text of synopsis and use generalized terms.
- Mention type of cryptocurrency (Bitcoin, Ethereum and Ripple) in methodology.
- How long will be short-term or long-term forecast? Mention in methodology
- 8. How the price will be estimated during recession period?
- Delete a statement after subheading "time frame"

#### Agenda Item No.19, B. 2

Shamsham Kiran, MS Scholar in Computer Science (Reg. # CS320211003)

#### Research Title: Approved

AN INTELLIGENT AND SECURE TRANSACTION ROUTING PROTOCOL FOR DISTRIBUTED LEDGER IN INTERNET OF THINGS

#### Supervisor-I

Dr. Amjad Mehmood. Institute of Computing, KUST

#### Supervisor-II

Dr. Muhammad Altaf, Institute of Computing, KUST

# RESEARCH PROPOSAL: Approved with changes

Decision: Submit a revised synopsis to the Directorate of ASR after incorporating the suggestions/modifications pointed out by the Board as given below:

- 1. Introduction is lengthy, reduce it.
- Add citations in-text in introduction.

Page | 13

- Do correction for text line spacing as per KUST format.
- 4. Correct referencing errors.
- There is no uniformity in the time frame format, revise it correctly as per University format.

#### F- GENERAL CASES

#### Agenda Item No.20

Interruption of Study of Ms. Afifa Urooj Mirza, MPhil Scholar in Biotechnology & GF

Decision: The Board discussed the case and based on recommendation of DGC, Ms. Afifa Urooj Mirza, M.Phil. Scholar in Biotechnology & GE is allowed to interrupt her 6th Semester (Spring-2023) on the basis of special hardship subject to provision of verified documents to Directorate of ASR.

#### Agenda Item No.21

Request for Extension of 02 Semesters in r/o Shakeel Ahmad, Ph.D. Scholar of Chemistry

Decision: The Board discussed the case and based on recommendation of DGC. Mr. Shakeel Ahmad. Ph.D. Scholar in Chemistry is allowed/granted one-semester extension i.e., Spring-2023 for the completion of his Ph.D. degree.

#### Agenda Item No.22

Extension in the Study Period & Fee Remission in r/o Muhammad Tufail Afridi

Decision The Board discussed the case and based on admission in Spring-2019, Mr. Muhammad Tufail Afridi, MS Scholar in Computer Science is allowed/granted one-semester extension i.e., Spring-2023 for the completion of his MS degree. However, his request for fee remission is rejected.

Proceeding of Advance Studies & Research Board held on March 17, 2023

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# **Directorate of Quality Enhancement**

/KUST/QEC/PC/23 Date: 26/06/23

# Anti-Plagiarism Test Certificate

(Similarity Index Certificate)

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

Name of Scholar:

ARSLAN FAROOQ

Discipline (M.Phil./MS/Ph.D.):

MS

Department/Institute:

INSTITUTE OF COMPUTING

Title of Synopsis/Thesis:

INTERPRETABLE MULTI-HORIZON TIME CRYPTOCURRENCIES FORECASTING OF

LEVERAGING TEMPORAL FUSION TRANSFORMERS

Document Type (Synopsis/Thesis)

Thesis

Words Count

10835

Name and Designation of Supervisor

DR. MUHAMMAD IRFAN UDDIN, ASSOCIATE PROFESSOR. INSTITUTE OF COMPUTING, KUST

Plagiarism software (Similarity Index Checking) Software Generated ID for the Turnitin.com

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(Report generated on 26 June, 2023, 10: 51 PKT evidence attached)

Contents Excluded from the

document

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Prepared by:

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Checked by:

or. Faisal Mehmood, Asst. Director

Dr. Muhammad Zeeshan Bangash **Director Quality Enhancement Cell** 

Note: Technical Errors and Omissions are subject to be rectified.

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# **Directorate of Quality Enhancement**

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Director Quality Enhancement Cell KUST

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Page 2 | 2



# KOHAT UNIVERSITY OF SCIENCE & TECHNOLOGY INSTITUTE OF COMPUTING

Ref: 3 92 IoC/Dept. Presentation/23 May 29, 2023.

### CIRCULAR

It is hereby circulated for the information of all concerned that Mr. Arsalan Farooq, course registration no. DS320192002, MS scholar in Data Science will deliver departmental presentation titled "Interpretable Multi-Horizon Time Series Forecasting of Cryptocurrencies by Leveraging Temporal Fusion Transformers" June 06, 2023 (Tuesday) at 02:00 pm in the IoC conference hall.

All respected faculty members and graduate students are invited to attend the mentioned event on given date, time and venue.

Director Institute of Computing

Copy to:

- Dean, Faculty of Physical & Numerical Sciences
- Director AS&R
- 3. Director QEC
- 4. Director Academics
- Coordinator MS/Ph.D.

(with request to inform all IoC MS and PhD Scholars to attend the presentation)

6. Office file

Mailing Kohat-26000, K.P. Pakistan Web www.kust.edu.pk

Tel +92-922-52914674 Fax +92-922-554 556



# KOHAT UNIVERSITY OF SCIENCE & TECHNOLOGY INSTITUTE OF COMPUTING

Title of Dissertation: Interpretable Multi-Horizon Time Series Forecasting of Cryptocurrencies by Leveraging Temporal Fusion Transformers

Presenter:

Mr. Arsalan Farooq, course registration no. DS320192002, MS scholar in Data Science

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MS Coordinator Institute of Computing



### Interpretable Multi-Horizon Time Series Forecasting of Cryptocurrencies by Leveraging Temporal Fusion Transformers

#### Arslan Farooq

Institute of Computer Section Conversity of Sections and Technology Kedust 26600)

house Pakhtunkon a Pakistan

Front agalan945 gmail.com

ABSTRACT: This research since to use the proposed model for cryptocuttency markets to forecast significant events and make better-informed investment decisions. The Temporal Fusion Transformers (TFT) model comprises different components capable of attention analysis of time steps and also telling how much each feature contributes to forecasting. However, their hyperparameters preally influence the performance and accuracy of TFT. It is challenging to closose the text collection of six hyperparameters. The Adaptive Differential Evolution (ADE) method will increase forecast accuracy and stability by assigning optimized hyperparameters to the Temposal Lunion Transformers model. Which will produce an explicable most dynamic managements analysis, and we name our model ADE TFT.

53	IMCCRT-2023-4221	Forecasting of Cryptocurrencies by Leveraging Temporal Fusion Transformers	63
64	IMCCRT-2023-4222	Static and Dynamic Analysis of Car Front Bumber Using Different Materials	64
65	IMCCRT-2023-4223	Academic Performance Prediction using Imbalance Classification Methods: A Study	65
66	IMCCRT-2023-4224	Design and Analysis of Vertical Axis Wind Turbine Using CFD Analysis	66
67	IMCCRT-2023-4226	PG Students in National Institute of Rural Development and Panchayati Raj (NIRDPR), Hyderabad: A Study	67
68	IMCCRT-2023-4175	Personalized Travel Recommendation System	68



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

## CERTIFICATE OF THESIS COMPLETION

#### To be filed by student

Name of Student	Arslan Farooq
Registration Number	DS320192002
Degree Title	MS Data Science
Title of Thesis	Interpretable Multi-horizon Time Series Forecasting of Cryptocurrencies by
	Leveraging Temporal Fusion Transformers

Leveraging Temporal Fusion Transformers  celaration of Word Length and Ownership of Work  confirm that  The work presented in the Submission is my own.  Objectives of the research are addressed.  Format and all references are cited according to the accepted Kohat University of Science and Technology conventions.  I am not time barred (i.e. Not more than 4 years as restriction by HEC).  To be filed by supervisor(s)  The above-mentioned student hereby certify that:  The above-mentioned student is a registered Student of Kohat of University of Science and Technology.  The thesis has been reviewed thoroughly and have made amendments where required.  All the objectives of the research are achieved.  The work has been checked for plagiarism and proper use of citation and referencing.  The student is not time-barred.  The work has been completed to my satisfaction and is acceptable for examination*.  Supervisor's Comments (In case any supervisor is not satisfied):  2.  3.  4.  5.  6.	claration of Word Length and Ownership of Work  onfirm that  The work presented in the Submission is my own.  Objectives of the research are addressed.  Format and all references are cited according to the accepted Kohat University of Science and Technology conventions.  I am not time barred (i.e. Not more than 4 years as restriction by HEC).  24/7/2013  Signature of Spadent  o be filed by supervisor(s)  as supervisor of the student hereby certify that:  The above-mentioned student is a registered Student of Kohat of University of Science and Technology.  He/she has completed his/her thesis.  The thesis has been reviewed thoroughly and have made amendments where required.  All the objectives of the research are achieved.  The work has been checked for plagiarism and proper use of citation and referencing.  The student is not time-barred.  The work has been completed to my satisfaction and is acceptable for examination*.  Supervisor's Comments (In case any supervisor is not satisfied):	relaration of Word I	Lavagraina Tamaggal Paring Tamafangan
The work presented in the Submission is my own.  Objectives of the research are addressed.  Format and all references are cited according to the accepted Kohat University of Science and Technology Conventions.  I am not time barred (i.e. Not more than 4 years as restriction by HEC).  Signature of Sident  To be filed by supervisor(s)  as supervisor of the student hereby certify that:  The above-mentioned student is a registered Student of Kohat of University of Science and Technology. File/she has completed his/her thesis.  The thesis has been reviewed thoroughly and have made amendments where required. All the objectives of the research are achieved.  The work has been checked for plagiarism and proper use of citation and referencing. The student is not time-barred.  The work has been completed to my satisfaction and is acceptable for examination*.  Supervisor's Comments (In case any supervisor is not satisfied):  1.  2.  3.  4.  5.	The work presented in the Submission is my own.  Objectives of the research are addressed.  Format and all references are cited according to the accepted Kohat University of Science and Technology.  I am not time barred (i.e. Not more than 4 years as restriction by HEC).  24/7/2023  Signature of Opdent  O be filed by supervisor(s)  as supervisor of the student hereby certify that:  The above-mentioned student is a registered Student of Kohat of University of Science and Technology.  Hele'she has completed his/her thesis.  The thesis has been reviewed thoroughly and have made amendments where required.  All the objectives of the research are achieved.  The work has been checked for plagiarism and proper use of citation and referencing.  The student is not time-barred.  The work has been completed to my satisfaction and is acceptable for examination*.  Supervisor's Comments (In case any supervisor is not satisfied):	elaration of Word I	Leveraging Temporal Fusion Transformers
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# CLEARANCE CERTIFICATE

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