

# ABDULLAH N MALIK | Curriculum Vitae

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## SUMMARY

PhD in Pure Mathematics, with interests spanning applied category theory, data science, graph neural networks, machine learning, graph theory, microeconomics, quantum computing, the mathematical foundations of physics, and mathematical philosophy.

## EDUCATION

### FLORIDA STATE UNIVERSITY

Ph.D. in Pure Mathematics

Thesis: Simplicial Methods in Graph Machine Learning

8/2018 – 5/2024

Tallahassee, FL

CGPA: 3.63

### QUAID-E-AZAM UNIVERSITY

M.Phil. in Pure Mathematics

Thesis: Operator Algebras and The Foundations of Quantum Mechanics

2/2014 – 4/2016

Islamabad, Pakistan

CGPA: 3.80

### COMSATS INSTITUTE OF INFORMATION TECHNOLOGY

B.S. in Mathematics

Thesis: Engineering Deutsch-Jozsa Algorithm in Cavity QED via Bragg Regime

2/2008 – 2/2012

Islamabad, Pakistan

CGPA: 3.28

## PUBLICATIONS

- › Foster, T. S.; **Malik, A. N.** Wiesfeler and Leman Go Global Locally. In preparation
- › Capucci, M.; Gavranović, B.; **Malik, A.N.**; Rios, F., & Weinberger, J. On a fibrational construction for optics, lenses, and Dialectica categories. *entics*:14638, 4. 2024  
<https://doi.org/10.46298/entics.14638>
- › Behzad, M.; Adnan, N.; **Malik, A.N.**; Merchant, S.A. Technology-Embedded Hybrid Learning. Preprints 2018, 2018030229. <https://doi.org/10.20944/preprints201803.0229.v2>
- › Xing, Y. H., Farooq, M. U., **Malik, A. N.** Effects of Gender on the Performance of Microenterprises in Pakistan. *The International Journal of Humanities & Social Studies*, 5(11). 2017
- › **Malik, A.N.**, Kamran, T. Orthomodularity and the incompatibility of relativity and quantum mechanics. *Quantum Stud.: Math. Found.* 4, 171–179 (2017).  
<https://doi.org/10.1007/s40509-016-0092-8>
- › **Malik, A.N.** Non-isometric, involutive antiautomorphisms. *arXiv*:1603.08498, 2016

## EXPERIENCE

### ASSISTANT PROFESSOR

Tallahassee State College

Instructor of Record:

- › College Algebra
- › Precalculus Trigonometry
- › Mathematics in Context
- › Mathematical Thinking

Services:

- › Mentorship
- › Outreach
- › Math Jury
- › Committees
- › Training

- › Fall 2024, Spring 2025, Fall 2025
- › Spring 2025, Summer 2025, Fall 2025
- › Summer 2025
- › Fall 2025

- › Faculty mentor for scholarship recipients
- › Volunteered for Tallahassee Science Festival 2024
- › Judged for International Tournament for Young Mathematicians 2024
- › Member of Math Advisory Committee
- › Faculty Development

8/5/2024 – Present

Tallahassee, FL

## ADJUNCT FACULTY

Florida State University

Instructor of Record:

- › Linear Algebra
- › Calculus III
- › Calculus II

- ›› Spring 2025
- ›› Fall 2024
- ›› Summer 2024

5/6/2024 – 5/7/2025

Tallahassee, FL

## GRADUATE TEACHING ASSISTANT

Florida State University

Instructor of Record:

- › Calculus III
- › Calculus II
- › Calculus I

- ›› Fall 2023, Spring 2024
- ›› Summer 2023
- ›› Fall 2022, Summer 2022

8/19/2020 – 5/3/2024

Tallahassee, FL

Content Creator:

- › University-wide course notes for Pre-Calculus

Grader:

- › Introduction to Advanced Mathematics
- › Discrete Mathematics
- › Ordinary Differential Equations

- ›› Spring 2023
- ›› Fall 2022
- ›› Fall 2020

Lab Instructor:

- › Business Calculus

- ›› Spring 2022 & 2021; Summer 2021

Graduate Student Mentor:

- › Student: Ayotuntosomi Loye

- ›› Project: Simplicial Sets are Chu Spaces

## IN-CHARGE

Office of Hybrid Learning

COMSATS Institute of Information Technology, Virtual Campus

- › Conceptualized and implemented a proposal for a policy framework and educational model on 13 degree programs
- › Piloted the transition of 2 courses from face-to-face to hybrid for 16,500 students, that shaved off 3% of total expenses
- › Led a team of 15 Content Experts, 5 Instructional Designers, 3 Animation Creators, 2 Video Editors and 4 Web Developers, ensuring successful and smooth generation, processing, editing and deployment of academic content
- › Responsible for organizing and coordinating faculty development programs
- › Identified gaps in student ICT literacy and provided appropriate recommendations for improvement

8/21/2017 – 12/26/2017

Islamabad, Pakistan

## TEACHING ASSOCIATE

Department of Mathematics

COMSATS Institute of Information Technology, Virtual Campus

- › Moderated the following math courses:
  - ›› Analytical Number Theory, Measure Theory, Operations Research, Introduction to Hilbert Spaces, Functional Analysis, Business Mathematics, Partial Differential Equations, Mathematical Statistics, Business Mathematics and Statistics, Statistical Inference, Algebra, Real Analysis
- › M.Sc. Math undergraduate projects supervised:
  - ›› Theorem of Maria Pia Soler, Non-exhaustive Properties of Multiplicative Groups of Matrices, Axiom of Choice: Equivalents and Implications, Current trends in Quantum Logic, Summing the Divergent, Language of the Universe: The Mathematics of Thermodynamics, A Comparison of Set Theories, Physics by SU(2), Automorphisms of General Linear Group, An Overview of Intuitionistic Logic, Extensions of Real Numbers, Constructive Calculus

3/9/2013 – 8/22/2017

Islamabad, Pakistan

## SUBEDITOR (INTERN)

Pakistan Council for Science and Technology

- › Subeditor for PCST's journal Science, Technology and Development
- › Verification of data in Directory of Productive Scientists of Pakistan 2012
- › Organised opening ceremony for Science and Innovation Policy, Pakistan, 2012

10/15/2012 – 11/23/2012

Islamabad, Pakistan

## SUBEDITOR

UTrade (Pvt.) Ltd.

- › Led a team of 16 journalists, providing topic guidance and content development for company's signature monthly trade magazine UTrade
- › Wrote editorials and summaries for chief editor for 15 editions
- › Finalized printing and distribution of magazine to readers all over Pakistan
- › Critically analyzed data provided by journalists and improved data presentation

3/19/2011 – 9/30/2012

Islamabad, Pakistan

## TEACHING ASSISTANT

Department of Computer Science  
COMSATS Institute of Information Technology

➤ Conducted lab coding sessions for Introduction to Programming using C++ for 30 students.

Coding sessions were held 4 times a week

12/2009 – 5/2010

Islamabad, Pakistan

## SKILLS

### PROGRAMMING LANGUAGES LIBRARIES ED-TECH SOFTWARE LANGUAGES

**Experienced:** Python, LaTeX

pytorch | sklearn | dgl | sqlite3 | Pandas | networkx | pix2pix | numpy | multiprocessing

**LMS:** Canvas | Blackboard

CorelDRAW | MatLab | Maple

**Native:** Urdu | Potohari | Punjabi

**Familiar:** C++ | SQL

Grading Tools: Gradescope | Crowdmark

**Fluent:** English

## CERTIFICATIONS

### HANDS-ON DATA SCIENCE USING SQL, TABLEAU, PYTHON AND SPARK

LinkedIn Learning

➤ Use cases of above mentioned tools with examples

6/30/2024

[WWW.LINKEDIN.COM](https://www.linkedin.com/learning/certificates/1234567890)

Certificate

### AI IN FINANCIAL SERVICES

Upstart Network

➤ Understanding the use, limitations, benefits, and ethical considerations of AI in Finance

6/26/2024

[WWW.UPSTART.COM](https://www.upstart.com/certificates/1234567890)

Certificate

### DATASCIENCE BOOTCAMP

Erdős Institute

➤ **Project:** Crime prediction in Tallahassee, FL using maps generated by pix2pix.

➤ **Project:** Predict initial configuration of Conway's Game of Life

5/1/2024 and 5/1/2023

[WWW.ERDOSINSTITUTE.ORG/](https://www.erdosinstitute.org/certificates/1234567890)

Certificate

Certificate

### MASTER TRAINER

Higher Education Commission

➤ Faculty development training

5/1/2023

[WWW.HEC.GOV.PK](https://www.hec.gov.pk/certificates/1234567890)

Certificate

## HONORS & AWARDS

### DWIGHT B. GOODNER FELLOWSHIP

Florida State University

Awarded an additional stipend for Fall 2022 in recognition of exceptional performance as a Teaching Assistant.

[Certificate](#)

Spring 2023

### OUTSTANDING INSTRUCTOR AWARD

Florida State University

Honored as one of the top instructors in the Math Department. [Certificate](#)

Fall 2022

### AMS TRAVEL GRANT

AMS

Awarded AMS travel grant to meet MRC mentor Valeria de Paiva to continue working on project developed at the MRC 2022.

Fall 2022

### ACT MRC 2022

AMS

Attended Mathematics Research Committee for Applied Category Theory. Worked under Valeria de Paiva's group on Dialectica Categories.

Summer 2022

### ADELAIDE WILSON FELLOWSHIP

Florida State University

Received a one-time monetary disbursement as an promising newly admitted graduate student.

Fall 2018

### FULBRIGHT FELLOWSHIP

Florida State University

Awarded a fully funded, five-year merit fellowship for my PhD, including a stipend, book allowance, and travel allowance. [Certificate](#)

2017 Cohort

### MERIT SCHOLARSHIP

Quaid-e-Azam University

Tuition waiver for M.Phil.

Spring 2014

## PRIME MINISTER'S LAPTOP

Islamabad, Pakistan

Awarded a laptop from Pakistan's Prime Minister for M.Phil. degree as an honors graduate student. [Certificate](#)

## BEST TEACHER AWARD

CIIT, Virtual Campus

Top-rated teacher in all of Math Department. Received honorarium for performance. [Certificate](#)

## PAKISTAN ATOMIC ENERGY COMMISSION TALENT SCHOLARSHIP

Islamabad, Pakistan

Received a merit scholarship that fully covered all fees for my bachelor's degree, along with a stipend and book allowance.

Fall 2014

Fall 2014, Spring 2014, Spring 2016

2008 Cohort

## TALKS

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Abstracts, slides and/or notes for the talks are available on my [webpage](#).

### WEISFEILER AND LEHMAN CONSIDER SAMPLING

Blessings of Dimensionality

Seminar Talk

8/25/2024

Zoom

### COLORING GRAPHS AND BEYOND

Haverford College

Colloquium Talk

4/15/2024

Pennsylvania, PA

### FINDING CLIQUES WITHOUT FINDING CLIQUES

FSU Math Honors Day

Flash Talk

4/12/2024

Tallahassee, FL

### WEISFEILER AND LEHMAN USE SIMPLICIAL SETS: PSUEDOTOP VERTEX NEURAL NETWORKS

49th ANYSRGMC

Graduate Student Conference

3/22/2024

Syracuse, NY

### FINDING HIGHER STRUCTURES IN GRAPHS

Florida State University

Poster Presentation at Math Honors Day

4/14/2023

Tallahassee, FL

### AN INTRODUCTION TO BELL'S THEOREM

LOV103, Florida State University

Graduate Student Seminar Talk

11/04/2022

Tallahassee, FL

### INFINITE SIMPLICES: AN EXCURSION INTO SIMPLICIAL SETS

Florida State University

Public talk at Research Sharing Luncheon at Honors, Scholars and Fellows Society

8/19/2022

Tallahassee, FL

### A COMBINATORIAL APPROACH TO SIMPLICIAL SETS

LOV103 Florida State University

Topology Seminar Talk

8/11/2022

Tallahassee, FL

### AXIOMATIZATION OF DIFFERENTIAL COHOMOLOGY

Florida State University

Algebra Seminar Talk

8/21/2021

Zoom

### THE VARIATIONAL BICOMPLEX AND TAKENS' THEOREM

Florida State University

Candidacy Exam Talk

4/22/2020

Zoom

### HILBERT'S SIXTH PROBLEM AND TOPOS THEORY

LOV201, Florida State University

Graduate Student Seminar Talk

3/12/2019

Tallahassee, FL

### COEXISTENCE OF SEVERAL NON-HERMITIAN OBSERVABLES IN PT-SYMMETRIC QM

Delaware State University

4/23/2018

Dover, DE

Presentation for a class project

### **ORTHOMODULARITY AND INCOMPATIBILITY OF RELATIVITY AND QUANTUM MECHANICS**

International Islamic University

3rd National Conference on Mathematical Physics

3/27/2017

Islamabad, Pakistan

### **MATHEMATICS AND THE FORMALISM OF QUANTUM MECHANICS**

Quaid-e-Azam University

Pure Math Seminar Talk

12/03/2015

Islamabad, Pakistan

### **MATHEMATICS AND THE FORMALISM OF QUANTUM MECHANICS**

COMSATS Institute of Information Technology, Virtual Campus

Math Seminar Talk

8/12/2015

Islamabad, Pakistan

### **ALEXANDER GROTHENDIECK: THE MAN**

COMSATS Institute of Information Technology, Virtual Campus

General Seminar Talk

3/12/2015

Islamabad, Pakistan

### **1, 2,...**

COMSATS Institute of Information Technology, Virtual Campus

Math Seminar Talk

8/24/2014

Islamabad, Pakistan

### **FIXED POINT THEOREMS IN TOPOLOGY: APPLICATIONS**

COMSATS Institute of Information Technology, Virtual Campus

Math Seminar Talk

8/17/2014

Islamabad, Pakistan

### **THE COUNTER-INTUITIVE APPLICATIONS OF HARMONIC SERIES**

COMSATS Institute of Information Technology, Virtual Campus

Math Seminar Talk

1/1/2014

Islamabad, Pakistan

### **WHY INTUITIONISTIC LOGIC IS DE-CONSTRUCTIVE**

COMSATS Institute of Information Technology, Virtual Campus

Math Seminar Talk

11/22/2013

Islamabad, Pakistan

### **ENGINEERING DEUTSCH-JOZSA ALGORITHM WITH FLYING ATOMS**

International Conference and Workshop on Nanoscience and Technology 2012

Conference Talk

8/4/2012

Islamabad, Pakistan

### **LIMITS AND RANDOMNESS OF REASON**

COMSATS Institute of Information Technology

Undergraduate Seminar Talk

8/17/2011

Islamabad, Pakistan

## **SERVICE AND OUTREACH**

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### **JURY**

International Tournament for Young Mathematicians

Volunteered for tournament's jury duty

December 2024

[WWW.ITYM.ORG](http://WWW.ITYM.ORG)

### **READING GROUP**

Florida State University

Initiated and organized a weekly a reading group on Applied Category Theory by arranging speakers and talk titles

Spring 2023 – Spring 2024

Tallahassee, FL

### **ADVISOR**

Student Advisory Board

Volunteered on a student advisory board for the Honors, Scholars and Fellows Society at Florida State University.

Fall 2022

Tallahassee, FL

### **JUDGE**

Capital Regional Science and Engineering Fair

Volunteered as a judge for a statewide schools' Science Fair.

February 1, 2019

Tallahassee, FL

### **VOLUNTEER**

Research Sharing Luncheon

September 13, 2019

Tallahassee, FL

Volunteered for logistics support for Research Sharing Luncheon, organized by Honors, Scholars and Fellows Society at FSU.

## **VOLUNTEER**

**November 30, 2018**

### **Pakistan Day**

Tallahassee, FL

Volunteered as a waiter, serving Pakistani cuisine on Coffee Hour, part of a weekly event that celebrates one country's cuisine per week at Center for Global Education, FSU.

## **VOLUNTEER**

**February 2, 2019 & February 1, 2020**

### **Math Fun Day**

Tallahassee, FL

Volunteered for a public outreach and education event by the Math Department.

## **GARDENING**

**April 14, 2018**

### **The Spring Gardens**

Philadelphia, PA

Potted plants in a community vegetable garden as part of Fulbright Enrichment Seminar series.