

ABDULLAH N MALIK | Curriculum Vitae

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SUMMARY

I hold a 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, arXiv:2403.16388, 2024
- 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

ADJUNCT FACULTY

Florida State University

➤ Currently teaching Calculus II

5/6/2024 – 8/2/2024

Tallahassee, FL

GRADUATE TEACHING ASSISTANT

Florida State University

Solo Instructor:

➤ Calculus III

» Fall 2023, Spring 2024

➤ Calculus II

» Summer 2023

➤ Calculus I

» Fall 2022, Summer 2022

Content Creator:

➤ University-wide course notes for Pre-Calculus

Grader:

➤ Introduction to Advanced Mathematics

» Spring 2023

➤ Discrete Mathematics

» Fall 2022

➤ Ordinary Differential Equations

» Fall 2020

8/19/2020 – 5/3/2024

Tallahassee, FL

Lab Instructor:

› Business Calculus

›› Spring 2022 & 2021; Summer 2021

Graduate Student Mentor:

› Student: Ayotuntosomi Loye

›› Project: Simplicial Sets are Chu Spaces

IN-CHARGE

8/21/2017 – 12/26/2017

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

TEACHING ASSOCIATE

3/9/2013 – 8/22/2017

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

SUBEDITOR (INTERN)

10/15/2012 – 11/23/2012

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

SUBEDITOR

3/19/2011 – 9/30/2012

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

TEACHING ASSISTANT

12/2009 – 5/2010

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

SKILLS

PROGRAMMING LANGUAGES

Experienced: Python, LaTeX

Familiar: C++ | SQL

LIBRARIES

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

ED-TECH

LMS: Canvas | Blackboard

Grading Tools: Gradescope | Crowdmark

SOFTWARE

CorelDRAW | Microsoft Excel, Word and Powerpoint

LANGUAGES

Native: Urdu | Potohari | Punjabi

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)

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

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/

Certificate

Certificate

MASTER TRAINER

Higher Education Commission

›Faculty development training

5/1/2023

WWW.HEC.GOV.PK

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](#)

Fall 2014

BEST TEACHER AWARD

CIIT, Virtual Campus

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

Fall 2014, Spring 2014, Spring 2016

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.

2008 Cohort

TALKS

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

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 Presentation for a class project	4/23/2018 Dover, DE
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	8/17/2014 Islamabad, Pakistan

Math Seminar Talk

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

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

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

September 13, 2019

Tallahassee, FL

VOLUNTEER

Pakistan Day

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.

November 30, 2018

Tallahassee, FL

VOLUNTEER

Math Fun Day

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

February 2, 2019 & February 1, 2020

Tallahassee, FL

GARDENING

The Spring Gardens

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

April 14, 2018

Philadelphia, PA