

ABDULLAH N MALIK | Curriculum Vitae

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SUMMARY

I have a PhD in Pure Mathematics, and my research interests are in the domains of applied category theory, graph neural networks, machine learning, graph theory, quantum computing, 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

➤ Calculus II

5/6/2024 – 8/2/2024

Tallahassee, FL

GRADUATE TEACHING ASSISTANT

Florida State University

Solo Instructor:

➤ Calculus III

➤ Calculus II

➤ Calculus I

Content Creator:

➤ Course notes for Pre-Calculus

» Fall 2023, Spring 2024

» Summer 2023

» Fall 2022, Summer 2022

8/19/2020 – 5/3/2024

Tallahassee, FL

Grader:

- › Introduction to Advanced Mathematics » Spring 2023
- › Discrete Mathematics » Fall 2022
- › Ordinary Differential Equations » 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**8/21/2017 – 12/26/2017****Office of Hybrid Learning****COMSATS Institute of Information Technology, Virtual Campus**

Islamabad, Pakistan

- › 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

RESEARCH ASSOCIATE**3/9/2013 – 8/22/2017****Department of Mathematics****COMSATS Institute of Information Technology, Virtual Campus**

Islamabad, Pakistan

- › 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**

Islamabad, Pakistan

- › 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.**

Islamabad, Pakistan

- › Led a team of 16 writers, 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

TEACHING ASSISTANT**12/2009 – 5/2010****Department of Computer Science****COMSATS Institute of Information Technology**

Islamabad, Pakistan

- › Conducted lab coding sessions for Introduction to Programming using C++ for 30 students, 4 times a week

HONORS & AWARDS

DWIGHT B. GOODNER FELLOWSHIP**Spring 2023****Florida State University**Received additional stipend for Fall 2022 for being outstanding TA. [Certificate](#)

OUTSTANDING INSTRUCTOR AWARD

Florida State University

Among 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. Fully funded summer school.

Summer 2022

ADELAIDE WILSON FELLOWSHIP

Florida State University

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

Fall 2018

FULBRIGHT FELLOWSHIP

Florida State University

Fully funded merit fellowship for PhD, lasting 5 years with stipend, and book 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. 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

Merit scholarship. Funded all fees for bachelor's, and included 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 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

SELECTED CERTIFICATIONS

DATASCIENCE BOOTCAMP

Erdős Institute

›Project: Tallahassee crimemap generation using pix2pix.

›Project: Predict initial configuration of Conway's Game of Life

5/1/2024 and 5/1/2023

www.erdosinstitute.org/

Certificate (2024)

Certificate (2023)

MASTER TRAINER

HEC

Faculty development training

5/1/2023

Islamabad, Pakistan

Certificate

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

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 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

Philedelphia, PA