

# ABDULLAH N MALIK | Curriculum Vitae

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## SUMMARY

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PhD in Pure Math. Interested in applied category theory, graph neural networks, topological data analysis, quantum computing and foundations of physics. Eleven years of experience in academia, and two years of experience as a subeditor.

## EDUCATION

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### FLORIDA STATE UNIVERSITY

Ph.D. in Pure Mathematics

Thesis: Simplicial Methods in Graph Machine Learning

8/2018 – 5/2024

Tallahassee, FL

### QUAID-E-AZAM UNIVERSITY

M.Phil. in Pure Mathematics

Thesis: Operator Algebras and The Foundations of Quantum Mechanics

2/2014 – 4/2016

Islamabad, Pakistan

### 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

## EXPERIENCE

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### ADJUNCT FACULTY

Florida State University

› Calculus II

5/2024 – 8/2024

Tallahassee, FL

### GRADUATE TEACHING ASSISTANT

Florida State University

Solo Instructor:

› 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:

› 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, Summer 2021, Spring 2021

Graduate Student Mentor:

› Student: Ayotuntosomi Loye

›› Project: Simplicial Sets are Chu Spaces

### IN-CHARGE

Office of Hybrid Learning

8/21/2017 – 12/26/2017

Islamabad, Pakistan

### COMSATS Institute of Information Technology, Virtual Campus

- › Lead a team of Content Experts, an Instructional Design Professional, Computer Graphics experts, IT Specialists and Supplementary Instruction Leaders.
- › Made arrangements for faculty development.
- › Identified gaps in student ICT literacy and making appropriate recommendations.
- › Oversaw refinement of courseware.
- › Analyzed existing practices, and gauged them against successful ones.

#### 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

- › Subeditor for trade magazine UTrade.
- › Responsible for all magazine-related gamut, from writing assignments to final print.

#### TEACHING ASSISTANT

12/2009 – 5/2010

Department of Computer Science

Islamabad, Pakistan

COMSATS Institute of Information Technology

- › Course: Introduction to Programming (Language: C++)

#### CHIEF EDITOR

4/2009 – 2/2012

Synergy (Campus Magazine)

Islamabad, Pakistan

- › Responsible for all magazine-related gamut, from writing assignments to final print

## HONORS & AWARDS

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#### DWIGHT B. GOODNER FELLOWSHIP

Spring 2023

Florida State University

Received additional stipend for Fall 2022.

#### OUTSTANDING INSTRUCTOR AWARD

Fall 2022

Florida State University

Among the top instructors in the Math Department

#### AMS TRAVEL GRANT

Fall 2022

AMS

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

#### ACT MRC 2022

Summer 2022

AMS

Mathematics Research Committee for Applied Category Theory. Worked under Valeria de Paiva's group on Dialectica Categories. Fully funded summer school.

<b>ADELAIDE WILSON FELLOWSHIP</b> Florida State University Received a one-time monetary disbursement.	Fall 2018
<b>FULBRIGHT FELLOWSHIP</b> Florida State University Fully funded PhD for 5 years with stipend, and book and travel allowance.	2017 Cohort
<b>MERIT SCHOLARSHIP</b> Quaid-e-Azam University Tuition waiver for M.Phil.	Spring 2014
<b>PRIME MINISTER'S LAPTOP</b> Islamabad, Pakistan Awarded a laptop from Pakistan's Prime Minister for M.Phil. studies.	Fall 2014
<b>BEST TEACHER AWARD</b> CIIT, Virtual Campus Top-rated teacher in all of Math Department. Received honorarium for performance.	Fall 2014, Spring 2014, Spring 2016
<b>PAKISTAN ATOMIC ENERGY COMMISSION TALENT SCHOLARSHIP</b> Islamabad, Pakistan Funded all fees for bachelor's, and included stipend and book allowance.	2008 Cohort

## CERTIFICATIONS

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<b>DATASCIENCE BOOTCAMP</b> Erdős Institute Project: Tallahassee Crimemap	5/1/2024 <a href="#">Certificate</a>
<b>DATASCIENCE BOOTCAMP</b> Erdős Institute Project: Conway's Game of Life in Reverse	5/1/2023 <a href="#">Certificate</a>
<b>MASTER TRAINER</b> HEC Trained as Master Trainer in Pakistan Higher Education Commission's 29th Master Trainers Faculty Professional Development Program.	5/1/2023 <a href="#">Certificate</a>

## TALKS

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Abstracts, slides and/or notes for the talks are available on my webpage.

<b>COLORING GRAPHS AND BEYOND</b> Haverford College Colloquium Talk	4/15/2024 Pennsylvania, PA
<b>FINDING CLIQUES WITHOUT FINDING CLIQUES</b> FSU Math Honors Day Flash Talk	4/12/2024 Tallahassee, FL
<b>WEISFEILER AND LEHMAN USE SIMPLICIAL SETS: PSUEDOTOP VERTEX NEURAL NETWORKS</b> 49th ANYSRGMC Graduate Student Conference	3/22/2024 Syracuse, NY
<b>FINDING HIGHER STRUCTURES IN GRAPHS</b> Florida State University Poster Presentation at Math Honors Day	4/14/2023 Tallahassee, FL
<b>AN INTRODUCTION TO BELL'S THEOREM</b>	11/04/2022

LOV103, Florida State University Graduate Student Seminar Talk	Tallahassee, FL
<b>INFINITE SIMPLICES: AN EXCURSION INTO SIMPLICIAL SETS</b> Florida State University Public talk at Research Sharing Luncheon at Honors, Scholars and Fellows Society	<b>8/19/2022</b> Tallahassee, FL
<b>A COMBINATORIAL APPROACH TO SIMPLICIAL SETS</b> LOV103 Florida State University Topology Seminar Talk	<b>8/11/2022</b> Tallahassee, FL
<b>AXIOMATIZATION OF DIFFERENTIAL COHOMOLOGY</b> Florida State University Algebra Seminar Talk	<b>8/21/2021</b> Zoom
<b>THE VARIATIONAL BICOMPLEX AND TAKENS' THEOREM</b> Florida State University Candidacy Exam Talk	<b>4/22/2020</b> Zoom
<b>HILBERT'S SIXTH PROBLEM AND TOPOS THEORY</b> LOV201, Florida State University Graduate Student Seminar Talk	<b>3/12/2019</b> Tallahassee, FL
<b>COEXISTENCE OF SEVERAL NON-HERMITIAN OBSERVABLES IN PT-SYMMETRIC QM</b> Delaware State University Presentation for a class project	<b>4/23/2018</b> Dover, DE
<b>ORTHOMODULARITY AND INCOMPATIBILITY OF RELATIVITY AND QUANTUM MECHANICS</b> International Islamic University 3rd National Conference on Mathematical Physics	<b>3/27/2017</b> Islamabad, Pakistan
<b>MATHEMATICS AND THE FORMALISM OF QUANTUM MECHANICS</b> Quaid-e-Azam University Pure Math Seminar Talk	<b>12/03/2015</b> Islamabad, Pakistan
<b>MATHEMATICS AND THE FORMALISM OF QUANTUM MECHANICS</b> COMSATS Institute of Information Technology, Virtual Campus Math Seminar Talk	<b>8/12/2015</b> Islamabad, Pakistan
<b>ALEXANDER GROTHENDIECK: THE MAN</b> COMSATS Institute of Information Technology, Virtual Campus General Seminar Talk	<b>3/12/2015</b> Islamabad, Pakistan
<b>1, 2,...</b> COMSATS Institute of Information Technology, Virtual Campus Math Seminar Talk	<b>8/24/2014</b> Islamabad, Pakistan
<b>FIXED POINT THEOREMS IN TOPOLOGY: APPLICATIONS</b> COMSATS Institute of Information Technology, Virtual Campus Math Seminar Talk	<b>8/17/2014</b> Islamabad, Pakistan
<b>THE COUNTER-INTUITIVE APPLICATIONS OF HARMONIC SERIES</b> COMSATS Institute of Information Technology, Virtual Campus Math Seminar Talk	<b>1/1/2014</b> Islamabad, Pakistan
<b>WHY INTUITIONISTIC LOGIC IS DE-CONSTRUCTIVE</b> COMSATS Institute of Information Technology, Virtual Campus Math Seminar Talk	<b>11/22/2013</b> Islamabad, Pakistan
<b>ENGINEERING DEUTSCH-JOZSA ALGORITHM WITH FLYING ATOMS</b> International Conference and Workshop on Nanoscience and Technology 2012 Conference Talk	<b>8/4/2012</b> Islamabad, Pakistan

## PUBLICATIONS

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- 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
- Malik, A.N. Operator Algebras and Foundations of Quantum Mechanics. Diss. Quaid-e-Azam University, Islamabad, 2016
- Malik, A.N. Engineering Deutsch-Jozsa Algorithm in Cavity QED via Bragg Regime. Diss. COMSATS Institute of Information Technology, Islamabad, 2012.

## SKILLS

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**PROGRAMMING LANGUAGES** Experienced: Python, LaTeX      Familiar: C++ | SQL  
**LIBRARIES**      pytorch | sklearn | dgl | sqlite3 | Pandas | networkx | pix2pix | pandas | numpy  
**LANGUAGES**      Native: Urdu, Potohari, Punjabi | **Fluent:** English

## SERVICE AND OUTREACH

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- READING GROUP** **Spring 2023 – Present**  
Florida State University Tallahassee, FL  
Initiated a reading group on Applied Category Theory.
- ADVISOR** **Fall 2022**  
Student Advisory Board Tallahassee, FL  
Volunteered on a student advisory board for the Honors, Scholars and Fellows Society at Florida State University.
- JUDGE** **Spring 2019**  
Capital Regional Science and Engineering Fair Tallahassee, FL  
Volunteered as a judge for a statewide school's Science Fair
- VOLUNTEER** **Fall 2019**  
Research Sharing Luncheon Tallahassee, FL  
Volunteered for logistics support for Research Sharing Luncheon, organized by Honors, Scholars and Fellows Society at FSU.
- VOLUNTEER** **Fall 2019**  
Pakistan Day Tallahassee, FL  
Volunteered as a waiter, serving Pakistani cuisine on Pakistan Day, part of a weekly event that celebrates one country's cuisine at Center for Global Education, FSU.
- VOLUNTEER** **Spring 2018 & Spring 2019**  
Math Fun Day Tallahassee, FL  
Volunteered for a public outreach and education event by the Math Department.
- GARDENING** **Spring 2018**  
The Spring Gardens Philedelphia, PA  
Potted plants in a community vegetable garden as part of Fulbright Enrichment Seminar series.