

ABDULLAH N MALIK | Curriculum Vitae

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SUMMARY

PhD Candidate working on applied category theory and machine learning. Fulbright Alumnus. Interested in foundations of math and physics

EDUCATION

FLORIDA STATE UNIVERSITY

Ph.D. in Pure Mathematics

Thesis: Machine Learning with Simplicial Sets

8/2018 – 4/2024

Tallahassee, FL

QUAID-E-AZAM UNIVERSITY

M.Phil. in Pure Mathematics

Thesis: Operator Algebras and The Foundations of Quantum Mechanics

Degree date: 06/27/2016

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

TEACHING ASSISTANT

Florida State University

Solo Instructor:

›Calculus III

›Calculus II

›Calculus I

›› Fall 2023, Spring 2024

›› Summer 2023

›› Fall 2022, Summer 2022

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

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.

›Responsible for making arrangements for faculty development.

›Responsible for identifying gaps in student ICT literacy and making appropriate recommendations.

›Oversaw refinement of courseware.

›Analyzed existing practices, and gauged them against successful ones.

8/21/2017 – 12/26/2017

Islamabad, Pakistan

RESEARCH ASSOCIATE

3/9/2013 – 8/22/2017

Islamabad, Pakistan

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

› Trained as Master Trainer in Pakistan Higher Education Commission's 29th Master Trainers Faculty Professional Development Program.

INTERN

10/15/2012 – 11/23/2012

Islamabad, Pakistan

Pakistan Council for Science and Technology

› Chiefly appointed as 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

Islamabad, Pakistan

UTrade (Pvt.) Ltd.

› Subeditor for trade magazine UTrade.

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

TEACHING ASSISTANT

12/2009 – 5/2010

Islamabad, Pakistan

Department of Computer Science

COMSATS Institute of Information Technology

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

CHIEF EDITOR

4/2009 – 2/2012

Islamabad, Pakistan

Synergy

Campus Magazine

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

HONORS & AWARDS

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 included travel, lodging and food for one week.

ADELAIDE WILSON FELLOWSHIP

Florida State University

Received a one-time monetary disbursement.

Fall 2018

FULBRIGHT FELLOWSHIP

Florida State University

Fully funded PhD for 5 years with stipend, and book and travel allowance.

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. studies.

Fall 2014

BEST TEACHER AWARD

CIIT, Virtual Campus

Top-rated teacher in all of Math Department. Received honorarium for performance.

Fall 2014, Spring 2014, Spring 2016

PAKISTAN ATOMIC ENERGY COMMISSION TALENT SCHOLARSHIP

Islamabad, Pakistan

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.

WEISFEILER AND LEHMAN USE SIMPLICIAL SETS: PSUEDOTOP VERTEX NEURAL NETWORKS

LOV103, Florida State University

Machine Learning Seminar Talk

8/27/2023

Tallahassee, FL

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

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

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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

PUBLICATIONS

►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

PROGRAMMING LANGUAGES LIBRARIES LANGUAGES

Experienced: Python, LaTeX
pytorch | sklearn | dgl | sqlite3 | Pandas | Networkx
Native: Urdu, Potohari, Punjabi | **Fluent:** English

Familiar: C++ | SQL

SERVICE AND LEADERSHIP

READING GROUP

Florida State University

Initiated a reading group on Applied Category Theory.

Spring 2023 – Present

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

VOLUNTEER

Math Fun Day

Volunteered for public outreach program Math Fun Day

Spring 2019, Spring 2020

Tallahassee, FL

JUDGE

Capital Regional Science and Engineering Fair

Volunteered as a judge for a statewide school's Science Fair

Spring 2019

Tallahassee, FL

VOLUNTEER

Research Sharing Luncheon

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

Fall 2019

Tallahassee, FL

VOLUNTEER

Pakistan Day

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.

Fall 2019

Tallahassee, FL

VOLUNTEER

Math Fun Day

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

Spring 2018 & Spring 2019

Tallahassee, FL

GARDENING

The Spring Gardens

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

Spring 2018

Philadelphia, PA

REFERENCES

Title	Name	Email Address	Relationship
►Dr.	Tyler Foster	tyler@emelex.ai	PhD Supervisor
►Dr.	Penelope Kirby	pkirby@fsu.edu	Teaching Advisor
►Dr.	Thomas Needham	tneedham@fsu.edu	Teacher
►Dr.	Richard Bertram	bertram@math.fsu.edu	Teacher
►Dr.	Phil Bowers	bowers@math.fsu.edu	PhD Thesis Committee Member