

ABDULRAHMAN MOHAMMAD ALHARBI

✉ abdulrahman.alharbi@kaust.edu.sa ✉ a.m.alharbi@iu.edu.sa

 [LinkedIn](#)  [Personal Website](#)

Education

Doctor of Philosophy in Applied Mathematics

King AbdulUllah University of Science and Technology (KAUST)— Thuwal, Saudi Arabia

Graduated: *ongoing*

Thesis: *First-Order Mean-Field Games on Bounded Domains with Entry-Exit Flow Constrains and Contact-Set Condition*

Master of Science in Applied Mathematics

King AbdulUllah University of Science and Technology (KAUST)— Thuwal, Saudi Arabia

Graduated: *May 2019*

Thesis: *On the L^p -integrability of Green's function for elliptic differential operators*

GPA: **3.49** / 4

Bachelor of Arts in Mathematics (with honor)

Rutgers University— New Brunswick, NJ, United States

Graduated: *May 2017*

Major: *Mathematics*, Minor: *Physics*

GPA: **3.6** / 4

Professional Experience

• Teaching Assistant (February 2020 – Present)

Department of Mathematics, Faculty of Science, Islamic University of Madinah

- courses (as an instructor): college algebra and trigonometry (fall 2020)
- courses (as an assistant): calculus (spring 2020)

General Teaching and Work Experiences:

• Teaching Assistant (Fall 2024)

KAUST Master's of Professional Studies in Artificial Intelligence for Ministry of Interior (MOI)

KAUST & KAUST Academy, Riyadh/Thuwal, Saudi Arabia

- Assisted the primary instructor during problem-solving sessions for Linear Algebra and Calculus courses
- Ran Linear Algebra review and recitation sessions (in-person & on-line)
- Graded homework

• Teaching Assistant (Summer 2024)

KAUST Master's of Professional Studies in Artificial Intelligence for Ministry of Interior (MOI)

KAUST & KAUST Academy, Riyadh/Thuwal, Saudi Arabia

- Ran online lectures and problem-solving sessions for Linear Algebra
- Proctored and graded student exams

- **Teaching Assistant** (*Summer 2024*)
Ministry of Interior (MOI) Bridging Program
KAUST Academy, Thuwal, Saudi Arabia
 - Helped professional MOI employee assimilate to the Master's program
 - Assisted the primary instructor during problem-solving sessions for Linear Algebra course
 - Ran Linear Algebra review and recitation sessions
 - Proctored and graded students exams
- **Teaching Assistant** (*Summer 2024*)
Applied Mathematics 2: Graduate Course on PDEs and Their applications
KAUST, Thuwal, Saudi Arabia
 - Held office hours and corresponded to student questions
 - Graded Homework
- **Mathematics Instructor** (*Summer 2023*)
Saudi Research Science Initiative (SRSI)
KAUST Academy, Thuwal, Saudi Arabia
 - Gave a short course on geometry and vectors spaces
- **Teaching Assistant** (*Spring 2023*)
Numerical Methods for Differential Equations
KAUST, Thuwal, Saudi Arabia
 - Held office hours and corresponded to student questions
 - Graded Homework
- **Statistics Instructor** (*Summer 2018*)
KAUST Scientific Summer Program for Secondary School Students
KAUST, Thuwal, Saudi Arabia
 - Gave a crash course on combinatorics and statistics
 - Examined the students and assessed their improvement and performance
- **Peer-Mentor** (*Spring 2016*)
Calculus II: Sequences and series
Rutgers University, New Brunswick, NJ, United States
 - Assisted in problem solving sessions and aided student solving complicated application questions in calculus
 - Held office hours and answered students' questions

Skills

Computer Skills:

- Scientific Programming with Octave (M)
- Scientific Programming with Matlab (M)
- Java (B)
- Scientific Programming with Mathematica (B)
- Microsoft Office/LibreOffice (A)
- LaTeX (A)
- Operating Systems: Linux, Windows, Mac (A)
- Git (B)

Technical and Professional Skills:

- Critical Thinking and Problem Solving
- Meeting Management

Communication Skills:

- Fluent in Arabic and English
- Technical Report Writing
- Agenda Structuring and Record Preservation

Training and Enrichment Programs

- 2017** Directed Reading Program (DRP) on Lie Groups and ODE Symmetries at Rutgers University.
- 2016** Summer Internship on Calculus of Variations, Mathematica Programming, and Partial Differential Equations (PDE) at KAUST.
- 2016** KAUST Winter Enrichment Program (WEP)
- with a workshop on microcontrollers and Bluetooth communication.
- 2015** Directed Reading Program (DRP) on Group Theory at Rutgers University.
- 2015** KAUST Summer Research Program at the University of Texas.
- research on chemical pollutants in drinking water.
- 2013** Training Program for the Saudi Team for the International Mathematical Olympiad.
- 2012** Training Program for the Saudi Team for the International Mathematical Olympiad.
- 2011** Training Program for the Saudi Team for the International Mathematical Olympiad.
- 2010** Toastmasters Weekly Program for High School Students on Meeting Management, Public Speaking, and Improvisation.

Awards and Honors

- 2024** CEMSE Dean's List Award, King Abdullah University of Science and Technology (KAUST).
- 2016** First Place Team, Team Competition, Garden State Undergrad Mathematics Conference.
- 2016** Fourth Place (Tie), Individual Competition, Garden State Undergrad Mathematics Conference.
- 2016** 92nd Percentile, Putnam Competition, United States.
- 2015** Fourth Place Team, Team Competition, Garden State Undergrad Mathematics Conference.
- 2015** Fifth Place (Tie), Individual Competition, Garden State Undergrad Mathematics Conference.
- 2015** 85th Percentile, Putnam Competition, United States.
- 2014** 77th Percentile, Putnam Competition, United States.
- 2013** Bronze Medal, International Mathematical Olympiad (IMO).
- 2012** Bronze Medal, International Mathematical Olympiad (IMO).
- 2012** Bronze Medal, Balkan Mathematical Olympiad (BMO).
- 2012** Second Place (Silver Medal), Gulf Mathematical Olympiad (GMO).
- 2011** Third Place (Tie, Bronze Medal), KFUPM Mathematical Olympiad.
- 2011** Third Place, National Mathematical Olympiad.

Presentations and Poster Sessions

Lecture Presentation:

- [3] Title: *A First-Order Mean-Field Game on a Bounded Domain with Mixed Boundary Conditions*
Event: The **14th AIMS Conferenc** on Dynamical Systems, Differential Equations, and Applications
Date: **17 December 2024**
Host: **NYU Abu Dhabi**
Location: ADNEC, **Abu Dhabi**, UAE
- [2] Title: *Mean-Field Games: Contemporary Topic in the Theory of Optimal Control*
Event: The **Scientific Week** of the Islamic University
Date: **13 February 2022**
Host: **The Islamic University of Al-Madinah**– The *Department of Mathematics*
Location: The Faculty of Science, IU, **Al-Madinah**, Saudi Arabia
- [1] Title: *Mean-Field Games: Contemporary Topic in the Theory of Optimal Control*
Event: **1st AMCS Workshop for Higher Education Instructors**
Date: **19 August 2021**
Host: **KAUST**– The Office of *Strategic National Advancement*
Location: KAUST, **Thuwal**, Saudi Arabia

Posters Presentation:

- [2] Title: *On the Free Boundary of the Mean-field Game*
Event: The **Long Time Behavior and Singularity Formation in PDEs: Part VII**
Date: **14 December 2024**
Host: **New York University Abu Dhabi (NUYAD)**, *SITE Center*
Location: NYUAD, **Abu Dhabi**, UAE
- [1] Title: *Examining the Chemical Contaminants in Common Bottled Water Brands*
Event: **KAUST Summer Research Program**
Date: **21 August 2015**
Host: **KAUST** and **University of Texas at Austin (UT Austin)**
Location: UT Austin, **Austin**, the United States of America

Publications

- [2] **A. M. Alharbi**, Diogo Gomes, Giuseppe Di Fazio, and Melih Ucer;
Regularity for Weak Solutions to First-Order Local Mean Field Games (preprint), 2024
<https://arxiv.org/abs/2411.15174>
- [1] **A. M. Alharbi**, Yuri Ashrafiyan, and Diogo Gomes;
A First-Order Mean-Field Game on a Bounded Domain with Mixed Boundary Conditions (preprint), 2025
<https://arxiv.org/abs/2305.15952>