# Alaa Haj Ali

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CONTACT
INFORMATION

Purdue University
Mathematical Science Building (Office: 844)
150 N. University Street
West Lafayette, IN 47907, USA

hajalia@purdue.edu
https://www.math.purdue.edu/ hajalia/

CITIZENSHIP

United States

RESEARCH
INTERESTS

Partial Differential Equations, Calculus of Variation, Free Boundary Problems.

OCCUPATION

**Golomb Visiting Assistant Professor of Mathematics, Purdue University**     **August 2019-present**

Mentors: Donatella Danielli and Arshak Petrosyan

EDUCATION

**Ph.D in Mathematics, Wayne State University**     **May 2019**

❑ Dissertation Topic: Existence,Uniqueness, and Symmetry Properties of Free Boundary Problems
for some Non-Linear Degenerate Elliptic Second Order Partial Differential Equations
❑ Advisor: Peiyong Wang

**B.S. in Mathematics, University of Michigan-Dearborn**     **August 2012**

❑ Minor in computer science

PAPERS

Haj Ali, A. and Wang, P., *The one-phase bifurcation for the p-Laplacian*, Journal of Differential
Equations, Vol 266, Issue 4, Feb 2019, page 1899 - 1921 https://arxiv.org/abs/1801.06221

Haj Ali, A., Li, D. and Wang, P., *Symmetry and approximate symmetry of a nonlinear elliptic problem over a ring*, Calculus of Variations Vol 59, Issue 2, March 2019, http://arxiv.org/abs/1711.07109

Haj Ali, A. and Wang, P., *Symmetry and approximate symmetry for a nonlinear elliptic problem
associated with the p-Laplace operator*, preprint.

Charro, F., Haj Ali, A., Torres, M., and Wang, P., *Bifurcation Phenomenon in a singularly perturbed
two phase free boundary problem of phase transition*, preprint.

INVITED
PRESENTATIONS

*Symmetry and Approximate Symmetry of a Nonlinear Elliptic Problem over a Ring* , PDE Seminar,
Purdue University, IN, USA. (October 2019).

*Radial Symmetry for the p-Laplace Operator*, Special Session on Fully Nonlinear Elliptic and Parabolic
PDE, AMS Fall Central Sectional Meeting, University of Wisconsin-Madison, Wisconsin, USA.
(September 2019).

*The One-Phase Bifurcation for the p-Laplacian*, SIAM Great Lakes Section Annual Meeting, Wayne State University, Detroit, MI, USA. (April 2018).

*The One-Phase Bifurcation for the p-Laplacian*, Special Session on Differential Equations and Applications, AMS Spring Central Sectional Meeting,Ohio State University, Columbus, OH, USA. (March 2018).

*Symmetry and approximate symmetry of a nonlinear elliptic problem over a ring*, Special Session on Nonlinear Elliptic and Parabolic PDE and Their Various Applications, AMS Spring Central Sectional Meeting, Indiana University, Bloomington, IN, USA. (April 2017).

*The Free Boundary Condition And Non-Degeneracy For A General Nonlinear Operator*, PDE Seminar, Purdue University, West Lafeyette, IN, USA. (April 2016).

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| CONFERENCE ATTENDED | Joint Mathematics Meetings,Baltimore Convention Center, Baltimore, Maryland, USA. (January 2019) |

Joint Mathematics Meetings, San Diego Convention Center, San Diego, California, USA. (January 2018)

Special Session on Now Developments in the Analysis of Nonlocal Operators, AMS Fall Central Sectional Meeting, University of St. Thomas (Minneapolis Campus), Minneapolis, MN, USA. (October 2016)

TEACHING
EXPERIENCE

❏ **Courses Taught at Purdue University**

| MA 266 | Ordinary Differential Equations | 2 sections | 3 credits | 39 students each section | Spring 2021 |
|---|---|---|---|---|---|
| MA 266 | Ordinary Differential Equations | 2 sections | 3 credits | 39 students each section | Fall 2020 |
| MA 341 | Foundation of Analysis | 1 sections | 3 credits | 42 students | Summer 2020 |
| MA 265 | Linear Algebra | 2 sections | 3 credits | 40 students each section | Spring 2020 |
| MA 266 | Ordinary Differential Equations | 2 sections | 3 credits | 40 students each section | Fall 2019 |

❏ **Courses Taught at Wayne State University**

| MAT | 2010 | Calculus 1 | 4 credits | 36 students | Winter 2018 |
|---|---|---|---|---|---|
| STA | 1020 | Elementary Statistics | 3 credits | 34 students | Fall 2017 |
| MAT | 1800 | Elementary Functions (Pre-calculus) | 4 credits | 30 students | Winter 2017 |
| MAT | 1800 | Elementary Functions (Pre-calculus) | 4 credits | 25 students | Winter 2016 |

AWARDS

*Thomas C. Rumble University Graduate Fellowship*     2018-2019
    Mathematics Department, Wayne State University

*Teaching Graduate Assistance (GTA) Award*     2017-2018
    Mathematics Department, Wayne State University

*Graduate Assistance In Area of National Needs (GAANN) Fellowship*     2014-2017
    Mathematics Department , Wayne State University

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| | *Zelonka Endowed Scholarship* | Winter 2014 |
| | Wayne State University, Department of Mathematics | |
| PROFESSIONAL TRAVEL AWARD | *AMS travel support award for Meeting Attendance* | Spring 2017 |
| | American Mathematical Society | |
| PROGRAMMING SKILLS | C++, Excel, Mathematica and Python | |
| LANGUAGE SKILLS | Arabic, English, French | |