

Curriculum Vitae

Hussein Awala

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Personal Statement:

I am a fifth year PhD candidate in the Department of Mathematics at Temple University working at the interface between Harmonic Analysis, Partial Differential Equations and Geometric Measure Theory under the direction of Professor Irina Mitrea.

Education :

2012	Temple University	PhD in Mathematics (continuing)
2010/2012	American University of Beirut	Master's in pure mathematics
2007/2010	Lebanese university	Bachelor degree in pure mathematics

Research Information:

- My research interests include Real and Harmonic Analysis, Partial Differential Equations, Geometric Measure Theory, and Validated Numerics.
- I am part of a SQuaRE research group at the American Institute of Mathematics and our program is titled: “*Validated Numerics for Harmonic Analysis and Partial Differential Equations*”, November 10-14, 2014, November 15-19, 2015, November 14-18, 2016.
- I completed a Master's thesis with Professor Nazih Nahlus entitled: “*Ultra products and Quotients of Infinite Direct Products of Lie Algebras*”.

Publications:

- *On the Solvability of the Zaremba Problem in Infinite Sectors and the Invertibility of Associated Singular Integral Operators*, with I. Mitrea and K. Ott, to appear in *Applied and Numerical Harmonic Analysis*, 30 pages.
- *The Spectrum of Biharmonic Layer Potentials on Curvilinear Polygons*, with I Mitrea, 20 pages, in preparation.
- *On the Mixed Boundary Value Problem for the Lamé system in Two-Dimensions*, with I. Mitrea and W. Tucker, in preparation.
- *Spectral Properties of Singular Integral Operators in Two Dimensional Uniformly Rectifiable Domains*, with I. Mitrea and M. Mitrea, 10 pages, in preparation.

Research Talks and Posters:

- A twenty minute talk entitled: “*Validated Numerics Methods for the Mixed Boundary Value Problem for the System of Elastostatics*”, presented during the 17th International Symposium on Scientific Computing, Computer Arithmetics and Verified Numerics. Uppsala University, Uppsala, Sweden. September, 2016.
- A twenty minute talk entitled: “*Mellin Transform Techniques for the Mixed Problem in Two Dimensions*”, presented during

- Prairie Analysis Seminar. University of Kansas, Lawrence KS. September 2016.
- The 15th New Mexico Analysis Seminar. University of New Mexico, Albuquerque, NM. February 2016.
- A fifty minute talk entitled: “*Jump Formulas for Tempered Distributions*”, presented during the Analysis Seminar, Temple University, Philadelphia PA. December 2015.
- A fifty minute talk entitled: “*Spectral Properties of the Hardy Kernel Operators and Application to Second Order Elliptic Boundary Value Problems*”, presented during the
 - Graduate Seminar. Temple University. Philadelphia, PA. January, 2016.
 - Analysis Seminar, Temple University, Philadelphia PA. December 2015.
- A fifty minute talk entitled: “*Inverting double layers on Lebesgue spaces on the boundary of Lipschitz domains*”, presented during the
 - Graduate Seminar. Temple University. Philadelphia, PA. September 11, 2015.
 - Analysis Seminar, Temple University, Philadelphia PA. April 2015.
- A research poster entitled: “*The Mixed Problem for the Laplacian in Polygonal Domains*”, presented during:
 - 8th Workshop on Geometric Analysis of PDEs and Several Complex Variables. Serra Negra, São Paulo, Brazil. August 3, 2015.
 - February Fourier Talks. University of Maryland, College Park, Maryland. February 2015.
 - Progress in Harmonic Analysis and Geometric Measure Theory. Temple University, Philadelphia PA. April 2014.
- A twenty minute talk entitled: “*On the mixed boundary value problem for the Laplacian in polygonal domains in two dimensions*”, presented during the
 - 72nd Midwest PDE Seminar. Purdue University, West Lafayette, IN. November 2013.
 - Eastern Pennsylvania and Delaware Section of the Mathematical Association of America Meeting. St. Joseph’s University, Philadelphia PA. November 2013.

For more information on my talks please check husseinawala.com/talks.

Conferences and Summer Schools: I attended the following events:

- *Harmonic Analysis and Elliptic Equations on Real Euclidean Spaces and on Rough Sets Summer School*. Mathematical Sciences Research Institute (MSRI), Berkeley CA. June 2016.
- *NSF-CBMS Regional Conference in the Mathematical Sciences*. North Dakota State University, Fargo, ND. July 27, 2015.
- *6th Symposium on Analysis and PDEs*. Purdue University, West Lafayette, IN. June 1, 2015. Participant.
- *Geometry and Analysis Summer School*. Mathematical Sciences Research Institute (MSRI), Berkeley CA. July-August 2014.
- *Eastern Sectional Meeting of the American Mathematical Society*. Temple University, Philadelphia PA. October 2013.
- *Geometry and Physics XI Workshop*. University of Pittsburgh, Pittsburgh PA. August 2013.
- *Workshop on Modular forms and Related Topics*. Center of Advanced Mathematical Sciences (CAMS), American University of Beirut, Beirut, Lebanon. February 2012.

Teaching experience:

During my graduate studies I earned a Teaching in Higher Education Certificate from Temple University's Teaching and Learning Center, August 2015, and I have taught the following courses:

- Math 4096: *Senior Problem Solving (writing intensive)* - focused on introducing students to a variety of problem solving techniques in mathematics and on developing rigorous writing skills. Spring 2016 (Co-teacher).
- Math 1042: *Calculus II* - anti-derivatives, integrals, sequences, and series with applications. Summer 1 2014 (one section 20 students), Spring 2015 (one section of 30 students), Fall 2015 (one section of 35 students).
- Math 1041: *Calculus I* - limits, continuity and differentiability with applications. Spring 2014 (one section of 35 students), Summer 1 2015 (one section of 20 students).
- Math 0824: *Mathematical patterns (general education course)* - numbers, statistics, probability, election systems, and scaling. Fall 2012 (2 sections: 27 students and 29 students), Summer 1 2013 (one section of 6 students), Fall 2013(2 sections: each 29 students).

I was a Graduate Assistant at the American University of Beirut during 2010/2011 and 2011/2012. My responsibilities included grading homework, and providing office hours, and giving weekly problem solving sessions in the following courses:

- Math 210: *Introduction to Analysis* (Fall 2010, class of 25 students).
- Math 241: *Introduction to Abstract Algebra* (Fall 2011, class of 30 students).

For more information on my teaching experience please check : husseinawala.com/teaching.

Talks for Undergraduates:

- A twenty minute talk entitled: "*On the Proof of the Friendship Theorem*", presented during the Eastern Pennsylvania and Delaware Section of the Mathematical Association of America Meeting, Muhlenberg College, Allentown PA. April, 2016
- A fifty minute talk entitled: "*On the Partial Fraction of the Cotangent Function, and its Application to Riemann's Zeta Function*", presented during the Math Club Meeting, Temple University, Philadelphia PA. October, 2015.
- A twenty minute talk entitled: "*On the Partial Fraction of the Cotangent Function, and its Application to Riemann's Zeta Function*", presented during the Eastern Pennsylvania and Delaware Section of the Mathematical Association of America Meeting, University of the Sciences in Philadelphia PA. October, 2014.

Professional Activities:

- Member of the student organizing committee for the Philadelphia Undergraduate Mathematics Conference Series. Temple University, Philadelphia PA. April 25, 2015.
- Research mentor of two groups of students, Spring 2015. I have guided students in selecting a research topic and in making a poster presentation at the Philadelphia Undergraduate Mathematics Conference Series.
- Main organizer (out of three) of the Analysis Seminar, Department of Mathematics, Temple University. math.temple.edu/events/seminars/analysis/. 2016/2017.
- Treasurer Officer for the AWM (Association for Women in Mathematics) Student Chapter at Temple University.

Extracurricular Activities:

- A volunteer at the *MathCounts* regional competition for middle school students. Temple University in the Spring of 2016.
- A volunteer with the American Cancer Association (Philly Patient Ride). We provide rides for cancer patients to and from there treatment sessions. 2013/2014.
- A volunteer with Big Brother Big sister (Mentor). It is a program that matches Mentors with students from local elementary schools. 2014/2015.
- I participate in recreational activities with other colleagues from the department including soccer and basketball.

Computer skills:

- Matlab
- Microsoft Office
- Python
- Mathematica
- \LaTeX
- C++
- Maple.