

CONTACT INFORMATION	Don Myers 214 Department of Mathematics and Statistics American University Washington, DC 20016 USA <i>E-mail:</i> barouti@american.edu
RESEARCH INTERESTS	Data Mining, Mathematical Statistics, Numerical Optimization, Machine Learning.
EDUCATION	<p>University of Maryland Baltimore County (UMBC), Baltimore, Maryland USA</p> <p>Ph.D. in Applied Mathematics, August 2016</p> <ul style="list-style-type: none"> - Dissertation Topic: “ Clustering for Monitoring Distributed Data Streams” - Advisers: Dr. J. Kogan and Dr. Y. Malinovsky <p>M.S., Applied Mathematics, August 2013</p> <p>Rochester Institute of Technology (R.I.T), Rochester, New York USA</p> <p>M.S., Applied and Computational Mathematics, August 2011</p> <ul style="list-style-type: none"> - Master Thesis: “ Computing Hilbert Functions using the Syzygy and LCM-lattice methods” - Advisor: Dr. Manuel Lopez <p>University of Patras, Patras, Greece</p> <p>B.S., Mathematics, September 2008</p> <ul style="list-style-type: none"> - Degree Thesis: “ An Introduction to Gröbner Bases” - Advisor: Dr. Andreas Arvanitoyeorgos
CERTIFICATES	<p>American University, Washington, DC USA</p> <p><i>Certificate of Completion of the Training Course in Online Learning</i>, Spring 2017</p> <ul style="list-style-type: none"> - Awarded by the Center for Teaching, Research and Learning (CTRL)
ACADEMIC EXPERIENCE	<p>American University, Washington, DC USA</p> <p><i>Professorial Lecturer</i></p> <p>Create class curriculum and syllabus that is appropriate for class being taught. Provide students with the necessary resources and materials to help them understand the course content. Ensure students are assisted in developing personally and professionally.</p> <ul style="list-style-type: none"> - DATA 793, Data Science Practicum, Spring/Fall 2021. - STAT 412/612, Statistical Programming in R, Spring 2021. - STAT 427/627, Statistical Machine Learning, Spring/Fall 2019, Spring/Summer/Fall 2020, Fall 2021. - STAT 415/615, Regression, Spring/Summer 2020, Spring 2021. - MATH 222, Calculus II, Fall 2018. - MATH 160, Applied Precalculus, Spring 2018/Spring 2019. - STAT 202, Basic Statistics, Spring 2016, Spring/Summer 2017, Spring/Summer 2018, Summer/Fall 2019. - MATH 151, Finite Mathematics, Fall 2017. - MATH 150, Finite Mathematics, Spring 2017. - MATH 170, Precalculus, Fall 2016, Fall 2018, Fall 2020. - MATH 221, Calculus I, Fall 2016, Summer 2018.

DC Math Circle

Instructor/Visitor

September 2017 - December 2019

Build on students excitement about mathematics by encouraging them to express their passion through games, stories, or hands-on activities. Discuss and think about challenging problems together in a social context.

Adjunct Instructor

- STAT 202, Basic Statistics, Spring 2016.

University of Maryland Baltimore County, Baltimore, Maryland USA

Math Instructor

- MATH 151, Calculus I, Spring/Summer 2016.
- MATH 155, Applied Calculus, Summer 2013/2014/2015.

Math Teaching Assistant

August 2012 - May 2016

Head teaching assistant. Duties included mini lectures and worksheet preparation, shared administrative responsibilities with faculty instructor, fielding of all student inquiries, provide assistance with calculus-related questions, and grade weekly quizzes for over 100 students.

Courses: MATH 150 Precalculus, MATH 155 Applied Calculus, MATH 151 Calculus and Analytic Geometry I, MATH 152 Calculus and Analytic Geometry II. .

Math Gym Coach

August 2013 - May 2015

Participate in an active learning environment, engaging students in manipulating knowledge. Additional duties included office hours and grading problems for various levels of courses.

Courses: Precalculus, Applied Calculus, Calculus and Analytic Geometry I,II, and Multivariate Calculus.

Orientation Advisor

Summer/Winter 2014/2015/2016

Provide assistance in the overall provision of academic advising and registration assistance to the entirety of UMBC's entering undergraduate population.

Math Grader

Summer 2012

Grade homework problems for over 35 students.

Course: Finite Mathematics for Information Sciences.

Rochester Institute of Technology, Rochester, New York USA

Math Teaching Assistant

August 2009 - May 2011

Provide assistance with calculus-related questions and grade homework problems for over 30 students.

Courses: Project Based Calculus I, II, III, Calculus A, B, C.

Math Tutor

July 2009 - May 2010

Responsible for tutoring students in all undergraduate mathematics courses as well as helping them improve their study skills.

University of Patras, Patras, Greece

High School Math Tutor

October 2004 - May 2009

Responsible for tutoring high school students in various mathematics courses and responsible for preparing them for the Panhellenic Examinations in Greece.

Courses: Mathematics (Calculus), Euclidean Geometry, Analytic Geometry, Algebra, Trigonometry.

RESEARCH
EXPERIENCE

University of Maryland Baltimore County, Baltimore, Maryland USA

Graduate Assistant

August 2013 - May 2016

Developed approaches that enable monitoring values of an arbitrary threshold function over distributed data streams. Combined system theory techniques, clustering and principles of statistics have been used.

Graduate Research Assistant

August 2011 - August 2012

Introduced a mathematical model for a Quartz-Enhanced Photo-Acoustic Spectroscopy (QEPAS) sensor with viscous damping that enabled us to numerically optimize sensor design. (Use of COMSOL 4.2)

Rochester Institute of Technology, Rochester, New York USA

Graduate Research Assistant

March 2011 - August 2011

Studied and developed new methods of extracting cardiac structures from MRI images based on image segmentation techniques. (Use of Matlab)

PUBLICATIONS

M. Barouti. “A Novel Approach for Computing Hilbert Functions”, arXiv preprint arXiv:1812.01757 (2018).

M. Barouti, D. Keren, J. Kogan and Y. Malinovsky. “Clustering for Monitoring Distributed Data Streams”, in *Partitional Clustering Algorithms*, M. Emre Celebi (eds.), Springer, pp. 387-415, 2015.

M. Barouti, D. Keren, J. Kogan and Y. Malinovsky. “Monitoring Distributed Data Streams Through Node Clustering”. In *proceedings of the International Conference on Machine Learning (MLDM'2014)*, July 21-24, 2014, St. Petersburg, Russia. Springer-Verlag Lecture Notes in Computer Science, Lecture Notes in Artificial Intelligence (LNAI), pp. 149-162.

M. Barouti, D. Keren, J. Kogan and Y. Malinovsky. “Adaptive Clustering for Monitoring Distributed Data Streams”. In *proceedings of the Workshop on Exploratory Data Analysis*, (held in conjunction with the 2014 SIAM International Conference on Data Mining, April 24-26, Philadelphia, PA). SIAM, Philadelphia, pp. 13-16.

SEMINAR
TALKS

Statistics and Data Science for a Better World, Virtual 63rd ISI World Statistics Congress, July 2021.

AU Summer Data Science Professional Development, Math/Stat and Physics Departments, American University, Washington, DC, July 2021.

Women in STEM, Her Campus American University, Washington, DC, November 2017.

Clustering for Monitoring Distributed Data Streams, Math/Stat Department Colloquia, American University, Washington, DC, October 2016.

Monitoring Distributed Data Streams through Node Clustering, UMBC Graduate Research Association (GRC), Baltimore MD, March 2015.

Adaptive Clustering for Monitoring Distributed Data Streams, 2014 SIAM International Conference on Data Mining, Philadelphia, PA, April 2014.

Deblurring Images, Matrices, Spectra, and Filtering, UMBC Graduate Student Seminar, Baltimore MD, March 2013.

Modeling and Optimization of QEPAS sensors, MIRTHE Summer Workshop, University of Mary-

land, Baltimore County, Baltimore MD, Aug. 2012.

Modeling Quartz-Enhanced Photoacoustic Spectroscopy (QEPAS) Sensors, UMBC Graduate Student Seminar, Baltimore MD, Feb. 2012.

POSTERS

Adaptive Clustering for Monitoring Distributed Data Streams, 2014 SIAM International Conference on Data Mining, Philadelphia, PA, April 2014.

Modeling and Optimization of QEPAS sensors, MIRTHE Site Visit, Princeton University, Princeton NJ, March 2012.

Segmentation of Magnetic Resonance Images for Structural Modeling of the Heart, (Poster), R.I.T Graduate Research Symposium, Rochester NY, July 2011.

SELECTED PROJECTS

Programming Projects in Parallel Computing, as a part of the course Introduction to Parallel Computing, Spring 2014.

Introduction to basic aspects of parallel programming and the algorithmic considerations involved in designed scalable parallel numerical methods. (Use of MPI)

Deblurring Images, Matrices, Spectra and Filtering, Supervisor Dr. Florian Potra, Spring 2013. Study of modern techniques for solving realistic large-scale problems in image deblurring.

Programming Projects in C, as part of the course Computational Mathematics and C programming, Feb - May 2013.

Introduction to theory and computational algorithms in selected topics of interest to mathematicians, engineers and scientists. Includes design and implementation of algorithms as C programs.

Modeling and Optimization of QEPAS sensors, Supervisor Dr. John Zweck, Dr. Susan Minkoff, Aug. 2012.

Introduce a mathematical model for a Quartz-Enhanced Photo-Acoustic Spectroscopy (QEPAS) sensor with viscous damping that will enable us to numerically optimize sensor design. (Use of COMSOL 4.2)

Computing Hilbert Functions using the Syzygy and LCM-lattice methods, (**Master Thesis**), Supervisor Dr. Manuel Lopez, Aug. 2011.

Study of the growth rate within families of Hilbert functions generated via an inverse difference table, in particular the doubling behavior empirically observed within some of those families. (Use of Macaulay2-Excel)

Segmentation of Magnetic Resonance Images for Structural Modeling of the Heart, as part of the research position at R.I.T, July 2011.

Developed an algorithm based on Active Contours method for segmenting 3-D cardiac images with little to no user input. (Use of Matlab)

Babai's algorithm and using a "good" basis to solve approx CVP, as part of the course Mathematical Cryptography, May 2010.

Described the Closest Vector Problem and presented the basic idea of Babai's algorithm by solving an example in a Lattice L of dimension 2. Described the difficulties of counting the distance between two points in a Lattice of higher dimension.

The Data Clustering Problem, as part of the course Methods of Scientific Computing, April 2010.

Used of a method (SVD and K-means clustering) in order to recover the best estimate of the original image from its noisy version. (Use of Matlab)

Real World Connectivity, as part of the course Graph Theory, September 2009.
Used a graph to model the infrastructure of National Lambda Rail, a national computer network that uses fiber-optic lines.

An Introduction to Gröbner Bases, (**Degree Thesis**), Feb. 2007.
Analyzed Grobner Bases and their applications to cryptography and computer science.

SUPPORT

Teaching Assistantship (08/12-05/16)
University of Maryland, Baltimore County

Research Assistantship (08/11-08/12)
Mid-InfraRed Technologies for Health and the Environment (MIRTHE), an NSF Engineering Research headquartered at Princeton University, with partners City College New York, Johns Hopkins University, Rice, Texas A&M and University of Maryland, Baltimore County

Teaching Assistantship (07/09-03/11)
Rochester Institute of Technology, Rochester NY

STUDENT
ADVISING

Yon Garber B.S. in Business Administration/Data Science **Fall 2018 - Spring 2019**
Fall 2018: Design of experimental learning projects in order to familiarize the student with mathematical and statistical tools used for further research.
Spring 2019: Collect public political data from available literature for detection of fake news. Pre-process and perform some basic statistical analysis.

Siyu Li M.S. in Quantitative Analysis **Spring 2020 - Summer 2020**
Thesis Title: "Detection of Gender Bias and Prediction of Annual Income Using Machine Learning".
Summer research granted by the Department of Mathematics and Statistics, American University.

Chace Paulson, Minh-Tuan Nguyen M.S. in Data Science **Fall 2020**
Shalini Ramachandra B.S. in Statistics and Public Health
The Census Bureau Opportunity Project (TOP): Develop a digital tool for monitoring and analyzing traffic patterns, air pollution and weather in the D.C. area.

Allison Ragan M.S. in Data Science **Spring 2021 - Summer 2021**
Research Project: "Child Abuse and Neglect in the United States: A Visual Exploration" granted by a Mellon Grant.

David Saff Internship **Summer 2021**
Conduct research on AFT members' compensation benefits and input such information into the department database. Adhere to set rules of existing database and also provide recommendations on how to improve the current system based on research conducted.
Faculty Supervisor: Maria Barouti

Alexis De Silva NASA Internship **Fall 2021**
Research Project: "Data Science and Statistical Analysis for Human Contributions to Safety Research." Faculty Supervisor: Maria Barouti

ACADEMIC
GRANTS/AWARDS

Office of Academic Affairs, American University
Curriculum Development of a Q2 (STAT 312) course in data science.
PI: Maria Barouti, Jane Wall, Michael Robinson (\$1500) **May 2019 - June 2020**
Role: Provide summer support for the three lead faculty members to develop the modules for the course.

Fall 2019 CAS Faculty Mellon Fund, American University

Data Analysis, Visualization, and Knowledge Discovery for Early Detection of Child Victimization. PI: Maria Barouti, Zois Boukouvalas, Nathalie Japkowicz, Alex Godwin, Alexandra Kapatou, Jane Wall, Toks Fashola, Mary W. Gray, Nimai Mehta (\$4000) **November 2019 - November 2020**
Role: Provide summer support to graduate and undergraduate students to work on the proposed tasks under the guidance of the faculty above.

HONORS AND AWARDS

Outstanding Graduate Teaching Assistant in the Field of Mathematics, UMBC, 2013.

Rochester Institute of Technology, 2011 BERNOULLI Award for Academic and Athletic Accomplishments.

PROFESSIONAL SERVICE

Associate Director of the Data Science Programs **January 2020 - Present**

My responsibilities as an Associate Director include, but are not limited to, assisting the Program Director with the following:

- oversee the development of course offerings,
- develop and submit course schedules,
- coordinate scheduling and staffing within math/stat department and with other departments,
- lead program meetings,
- recruit adjunct faculty members,
- develop and coordinate program events for the program,
- monitor faculty teaching in program,
- participate in study groups and task forces representing data science,
- cultivate majors,
- process and accept applicants through recruit system,
- provide ongoing student advising after admission,
- respond to prospect questions about the program,
- attend open houses for prospects,
- lead and fully coordinates the Data Science Practicum (Data 793),
- supervise and mentor undergraduate and graduate students through funded research and independent study projects as well as the Data Science Practicum course,
- reach out to other faculty, companies and institutions for collaborative research projects for DS graduate students,
- write and submit proposals in order to increase diversity in Data Science,
- organize Summer Professional Development Workshop for DCPS system teachers and staff.

MS committee member and thesis reader

Zack Nadrich M.S. in Statistics **Fall 2020**
Thesis Title: “Applications of a Spatial L-Temporal Markov Random Field”, American University

Lucas de Paula Damasceno M.S. in Teleinformatics Engineering **Spring 2021**
Thesis Title: “Independent Vector Analysis using Semi-Parametric Density Estimation via Multivariate Entropy Maximization”, Federal University of Ceara

Department of Mathematics and Statistics, American University

<i>Adjunct Hiring and Review Committee Member</i>	January 2020 - December 2021
<i>Awards Committee Member</i>	January 2020 - December 2021
<i>Data Science Graduate Studies Committee Member</i>	January 2020 - December 2021
<i>Facilities & Governance Major Program Review Committee Member</i>	January 2020 - December 2021
<i>Public Relations Committee Member</i>	January 2020 - December 2021
American Statistical Association	
<i>Publication Officer, ASA Statistics in Risk Analysis Section</i>	January 2018 - January 2020