

CONTACT INFORMATION	Don Myers 214 Department of Mathematics and Statistics American University Washington, DC 20016 USA <i>E-mail:</i> barouti@american.edu	
ACADEMIC APPOINTMENT	American University , Washington, DC USA <i>Director of the Online Data Science Masters Degree Program</i> <i>Sr.Professorial Lecturer</i> <i>Associate Director of the Data Science Programs</i> <i>Interim Director of the Online Data Science Masters Degree Program</i> <i>Professorial Lecturer</i>	January 2023 - Present September 2021 - Present January 2020 - Present June - December 2022 September 2016 - September 2021
EDUCATION	University of Maryland Baltimore County (UMBC) , Baltimore, Maryland USA Ph.D. in Applied Mathematics, August 2016 - Dissertation Topic: “ Clustering for Monitoring Distributed Data Streams” - Advisers: Dr. J. Kogan and Dr. Y. Malinovsky M.S., Applied Mathematics, August 2013 Rochester Institute of Technology (R.I.T) , Rochester, New York USA M.S., Applied and Computational Mathematics, August 2011 - Master Thesis: “ Computing Hilbert Functions using the Syzygy and LCM-lattice methods” - Advisor: Dr. Manuel Lopez University of Patras , Patras, Greece B.S., Mathematics, September 2008 - Degree Thesis: “ An Introduction to Gröbner Bases” - Advisor: Dr. Andreas Arvanitoyeorgos	
RESEARCH INTERESTS	Data Mining, Mathematical Statistics, Numerical Optimization, Machine Learning.	
CERTIFICATES	American University , Washington, DC USA <i>Certificate of Completion of the Training Course in Online Learning</i> , Spring 2017 - Awarded by the Center for Teaching, Research and Learning (CTRL)	
ACADEMIC GRANTS/AWARDS	NASA Space Grant, Department of Physics, American University Data Science Summer Professional Development Workshops for DCPS system teachers and staff. PI: Nathan Harshman. Grant Implementers: Maria Barouti, Betty Malloy, Jeff Gill, James Dickens Summer 2021, Summer 2022 Role: Throughout these workshops, in partnership with Data Science graduate students who supported both AU instructors and DCPS teachers, we successfully trained approximately 35 DCPS teachers in Data Science. 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.

TEACHING EXPERIENCE

American University, Washington, DC USA

Course Development

Developed the online Machine Learning course (STAT 427/627) for the Online Data Science program, using interactive technology to engage students. Focused on blending asynchronous and synchronous instruction, designed and adapted course materials accordingly. Aligned the learning outcomes with the on-campus courses, repurposing content to ensure consistency and effectiveness for both students and adjunct instructors in the online format.

Wrote a proposal for new curriculum for Data 312. This course serves as an AU core quantitative literacy course in data science and covers data visualization, text analysis and comparison, music analysis, and an introduction to machine learning and the associated ethical considerations.

- DATA 312, Data Science Applications.

Teaching

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.

- DATA 793, Data Science Practicum, Spring/Fall 2021, Spring/Fall 2022, Spring/Fall 2023, Spring/Fall 2024.
- 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.

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.

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.

INVITED TALKS

SAC's (Smith Analytics Consortium) 5th Annual Datathon.

UMD Smith Business School opened their annual datathon (sponsored by Deloitte) to AU students, which was also the first time they're allowing another university to participate. Served as a judge. Agreed to help with judging assigned students' presentations and completed a form for each team (5 teams). Scoring rubrics were provided. April 9-11, 2024.

DCPS Summer Professional Development Workshop, Math/Stat and Physics Departments, American University, Washington, DC, August 2022.

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

DCPS Summer Professional Development Workshop, 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 Maryland, 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

Detection of Online Sexism in Sports using Machine Learning and Natural Language Processing aimed to identify various forms of sexism, including subtle gender stereotypes, in online sports discussions. Collaborating with high school students and AU faculty, the team utilized NLP and machine learning to detect and address online sexism, contributing to a more inclusive environment for athletes. The project was organized by the Department of Mathematics and Statistics at American University and funded by the Blair Jones Summer Grant in Summer 2023.

SunnyR, a digital tool designed to help educators and students ages 12-17 face adversity and promote resilience by analyzing potential behavioral disorders and finding resources. Mindful activities may also be encouraged in the classroom to promote a healthier learning environment and a safe space. If appropriate, educators may also provide information discovered with this app to parents/guardians of targeted youth. Developed for the Census Bureau Opportunity Project by DS Graduate students and faculty in Fall 2022.

XamineYourWorld, a digital tool to build and improve data literacy skill. This tool uses 2020 Decennial Census Data and ACS Data to help K-12 students, teachers, and education stakeholders build data literacy skills through analyzing, assessing, and taking action with data visualizations. Developed for the Census Bureau Opportunity Project by DS Graduate students and faculty in Fall 2021. (<https://decennialcensusdataliteracy2021.shinyapps.io/TOProject/>)

AirMotionDC, a digital tool for monitoring and analyzing traffic patterns, air pollution and weather in the D.C. area. *AirMotionDC* compiles and visually displays real time data on traffic patterns, air pollution, and weather in the District of Columbia to explore the relationship between transportation and air quality locally, at both a granular level and citywide level. Developed for the Census Bureau Opportunity Project by DS Graduate students and faculty in Fall 2020.

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 appr 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.

STUDENT
ADVISING

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

Alessandra Bielli Marketing Operations Internship - The Philadelphia Inquirer **Spring 2024**
The expected internship learning outcomes include using sql to clean data and tableau to visualize data, learning how to use data to predict viewers, and using data to come up with a marketing plan.
Faculty Supervisor: Maria Barouti.

Aiden Cheong , Kidus Zerihun , Jiyon Lee, Samantha Mai-Li Lau , Mira Epstein High School Students **Summer 2023**
High school students conducted research on Detection of Online Sexism in Sports using Machine Learning and Natural Language Processing. The project was organized by the Department of Mathematics and Statistics at American University and funded by the Blair Jones Summer Grant.
Faculty Supervisor: Maria Barouti

Tyler Halliwell MetLife Internship **Spring 2023**
Conducted research on CMIP liabilities and monthly financial projections. Built models and worked on the Anaplan model.
Faculty Supervisor: Maria Barouti.

Meera Patel, Lindsay Beyak, Jonathan Hague M.S. in Data Science **Fall 2022**
The Census Bureau Opportunity Project (TOP): Develop a digital tool SunnyR to help educators and students in Puerto Rico promote resilience by analyzing potential behavioral disorders and apt resources.

Haiman Wong, Jingyi Xu, Doudou Shi, Elizabeth Marge M.S. in Data Science **Fall 2021**
The Census Bureau Opportunity Project (TOP): Develop a digital tool XamineYourWorld to build and improve data literacy skills.

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

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.

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.

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.

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

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.

**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**

Director of the Online Data Science Masters Degree Program January 2023 - Present

My responsibilities as the Director of the Online Data Science Masters Degree include the following items:

1. develop, launch and manage the new program,
2. develop course schedules,
3. recruit new students and cultivate student enrollment,
4. recruit faculty and coordinate faculty teaching assignments,
5. lead the annual program assessment process,
6. consult with our Graduate Enrollment and Marketing (GEM) and Communications (COM) team,
7. advise admitted students on courses, program requirements and progress in program ,
8. manage online courses and platform,
9. integrate the program into AU-wide initiatives in coordination with the Office of the Chief Online Officer,
10. coordinate with the Chief Online Officer’s team of instructional designers,
11. attend open houses,
12. respond to prospect questions about the program. Address student program questions as they arise,
13. submit approved course substitutions, manage advising holds, assess prerequisite waivers, etc.,
14. review applications and determine merit awards for newly admitted students,
15. arrange new online student attendance at Math Bootcamp held beginning of each semester,
16. maintain database of applicants and enrolled students,
17. direct students to relevant online resources and services at AU,
18. provide job search and professional development guidance through Data 793 Practicum,
19. reach out to potential clients who could serve as Practicum partners,
20. alumni outreach,
21. review applications for adjunct positions, as needed,

22. hire, onboard, and mentor adjuncts,
23. address student and faculty issues across different courses,
24. lead and fully coordinate the Data Science Practicum (Data 793),
25. supervise and mentor graduate students through funded research and independent study projects as well as the Data Science Practicum Data 793 course,
26. recruit faculty, companies and institutions for collaborative research projects for DS graduate students to participate in practicum projects,
27. maintain online program infrastructure including marketing material,
28. write and submit proposals in order to increase diversity in Data Science,
29. lead Summer Professional Development Workshop for DCPS system teachers and staff
30. participate in regular meetings with program partners,
31. other items as they may arise.

Associate Director of the Data Science Programs

January 2020 - Present

My duties as Associate Director of the residential MS Data Science program closely align with those fulfilled as Director of the Online Data Science Program but are not limited to these. As Associate Director, my main objective is to support the Program Director in addressing any arising matters such as provide assistance for the BS Accreditation Review Process.

MS committee member and thesis reader

Zoë E. Laky M.S. in Psychology **Fall 2022**
 Thesis Title: “Using Machine Learning to Predict Quit Attempts among Cigarette Smokers”
 American University

Egzona Rexhepi M.S. in Statistics **Summer 2022**
 Thesis Title: “Independent Vector Analysis with Sparse Inverse Covariance Estimation”
 American University

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 Multi-variate Entropy Maximization”
 Federal University of Ceara

Department of Mathematics and Statistics, American University

Director of the Online Data Science Masters Degree Program **January 2023 - Present**

Adjunct Hiring and Review Committee Member of the Online MS DS Program **August 2023 - Present**

Mentor

Designated mentor for our new term faculty member who recently accepted an offer for an Assistant Professor role in our department. **August 2023 - Present**

Data Science Tenure-line Search Committee Member **August 2022 - Present**

<i>Rank Committee Member</i>	August 2022 - December 2025
<i>Outreach and Alumni Relations Committee Member</i>	August 2022 - December 2025
<i>Sr. Professorial Lecturer</i>	September 2021 - Present
<i>Associate Director of the Data Science Programs</i>	January 2020 - Present
<i>Data Science Practicum Coordinator</i>	August 2020 - Present
<i>Interim Director of the Online Data Science Masters Degree Program</i>	June 2022 - December 2022
<i>Data Science Graduate Studies Committee Member</i>	January 2020 - December 2023
<i>Moderator of Data Science and DS Student Listservs</i> Maintaining both Listservs, adding new DS students, and posting related job announcements, DS events/workshops, etc.	January 2020 - January 2023
<i>Adjunct Hiring and Review Committee Member</i>	January 2020 - April 2021
<i>Awards Committee Member</i>	January 2020 - April 2021
<i>Facilities & Governance Major Program Review Committee Member</i>	January 2020 - April 2021
<i>Public Relations Committee Member</i>	January 2020 - April 2021
<i>Professorial Lecturer</i>	September 2016 - September 2021
American Statistical Association	
<i>Publication Officer, ASA Statistics in Risk Analysis Section</i>	January 2018 - January 2020