

# MS programs in Statistics and Biostatistics at American University

College of Arts & Sciences > Mathematics & Statistics



<https://www.american.edu/cas/mathstat/statistics-ms>

Contact: [baron@american.edu](mailto:baron@american.edu)

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<https://www.american.edu/cas/mathstat/statistics-ms>

Contact: *baron@american.edu*

# HIGHLIGHTS

<https://www.american.edu/cas/mathstat/statistics-ms>  
Contact: *baron@american.edu*

## Study Statistics in the USA Capital!

American University in Washington DC offers the MS degree in Statistics, featuring:

- ❑ Rigorous training in statistical theory, methods, and applications;
- ❑ Small classes, low students to faculty ratio;
- ❑ Individual attention and individualized degree plans according to your career goals;
- ❑ Practical experience: research, teaching, consulting, and internship opportunities under faculty guidance;
- ❑ Two tracks: *Theory and Methods* and *Biostatistics*;
- ❑ Optional completion of a Graduate Certificate in *Data Science* while you pursue the MS degree, making you a formally certified specialist;
- ❑ *Financial support*: partial tuition remission, teaching and research assistantships on merit basis;
- ❑ Incoming M.S. in Statistics students are expected to have completed Calculus I–III and intermediate-level Statistics. However, we can tailor a degree plan for students who may be missing a prerequisite.

## **Related Links:**

- MS program in Statistics (including Biostatistics)
  - [www.american.edu/cas/mathstat/statistics-ms/](http://www.american.edu/cas/mathstat/statistics-ms/)
- Math & Stat Department
  - [www.american.edu/cas/mathstat/](http://www.american.edu/cas/mathstat/)
- Course descriptions
  - <https://catalog.american.edu/>, go to Courses
- Our professors and their research
  - <https://www.american.edu/cas/mathstat/faculty/index.cfm>
- Course schedules
  - <http://www.american.edu/provost/registrar/schedule/index.cfm>
- Submit application
  - <https://www.american.edu/cas/admissions/apply.cfm>

# ***Ask-Me-Anything Weekly Zoom Sessions***

**Every Monday at 12:00 – 1:00 pm ET**

**Link: <https://american.zoom.us/j/95868480371>**

Meet the MS-Statistics program director and ask about:

- Unique opportunities at American University
- Careers in Statistics
- Financial packages
- How to apply
- Curriculum, required and elective courses
- Research opportunities
- Internship opportunities
- Student life, student clubs
- Etc, etc, etc.

<https://www.american.edu/cas/mathstat/statistics-ms>  
Contact: Dr. Michael Baron - [baron@american.edu](mailto:baron@american.edu)

# OUR PROGRAMS

<https://www.american.edu/cas/mathstat/statistics-ms>

Contact: *baron@american.edu*

# MASTERS DEGREE IN STATISTICS

## STATISTICS (MS)

This program prepares professionals in the development, research, and analysis of quantitative tools to turn ideas into intelligent, informed actions.

## PROGRAM TRACKS

The [Statistics MS](#) offers two tracks of study: Theory and Methods and Biostatistics. Each of them can be combined with the Graduate Certificate in Data Science.

### THEORY and METHODS

Rigorous training in Statistics that is expected for M.S. level jobs and applications for Ph.D. programs.

### BIOSTATISTICS

Solid training in Statistics with Biostatistics and Biology components.

## ADMISSION TO THE PROGRAM

Applicants are expected to have a bachelor's degree from an accredited institution with a cumulative grade point average of 3.00 on a 4.00 scale and an adequate background in the mathematical sciences\*.

\*Prerequisites: Calculus I-III, matrices, and an intermediate level course in Statistics.

## DEGREE REQUIREMENTS

30 credit hours of graduate coursework including

- Mathematical Statistics
- Regression
- Statistical Machine Learning
- Advanced Machine Learning courses
- Deep Learning and Neural Networks
- Statistical Software, R and/or SAS
- Generalized Linear Models
- Research / Consulting / Internship experience

*Up to 9 approved graduate credit hours may be shared between the BS and MS degrees in a combined BS-MS program. Ask for information.*



## EMPLOYMENT OPPORTUNITIES

Departmental ties to governmental agencies such as the National Science Foundation, the Environmental Protection Agency, the Food and Drug Administration, and the National Institutes of Health offer students exposure to numerous research and employment opportunities. Currently, 100% of recent MS graduates in Statistics from AU are employed or pursuing their next degree (see [www.american.edu/weknowsuccess/](http://www.american.edu/weknowsuccess/)).

## CONTACT

AU MATH & STAT DEPARTMENT  
[www.american.edu/cas/mathstat/](http://www.american.edu/cas/mathstat/)

STATISTICS PROGRAM DIRECTOR  
Dr. Michael Baron, [baron@american.edu](mailto:baron@american.edu)  
Contact any time for more information ☎



# MASTERS DEGREE IN STATISTICS with the Graduate Certificate in Data Science

Rigorous training in Statistics + practical courses in Data Science = Exceptional Employment Opportunities!

- Pursue the [MS degree in Statistics](#) and the [Graduate Certificate](#) in Data Science at the same time.
- Enter the job market as the MS degree holder in Statistics and a certified specialist in Data Science.
- Total number of required graduate courses = 10. With proper planning, the Certificate courses are also counted toward the MS degree.

## STATISTICS (MS) with Graduate Certification

This program prepares professionals in the development, research, and analysis of quantitative tools to turn ideas into intelligent, informed actions.

### PROGRAM TRACKS

The [Statistics MS](#) offers two tracks of study: Theory and Methods and Biostatistics. Each of them can be combined with the Graduate Certificate in Data Science.

#### THEORY and METHODS

Rigorous training in Statistics that is expected for M.S. level jobs and applications for Ph.D. programs.

#### BIOSTATISTICS

Solid training in Statistics with Biostatistics and Biology components.

### ADMISSION TO THE PROGRAM

Applicants are expected to have a bachelor's degree from an accredited institution with a cumulative grade point average of 3.00 on a 4.00 scale and an adequate background in the mathematical sciences\*.

\*Prerequisites: Calculus I-III, matrices, and an intermediate level course in Statistics.

### DEGREE REQUIREMENTS

30 credit hours of graduate coursework including

- Mathematical Statistics
- Regression
- Statistical Machine Learning
- Statistical Software, R and/or SAS
- Data Science
- Advanced Machine Learning courses
- Deep Learning and Neural Networks
- Research / Consulting / Internship experience

*Up to 9 approved graduate credit hours may be shared between the BS and MS degrees in a combined BS-MS program. Ask for information.*

### EMPLOYMENT OPPORTUNITIES

Departmental ties to governmental agencies such as the National Science Foundation, the Environmental Protection Agency, the Food and Drug Administration, and the National Institutes of Health offer students exposure to numerous research and employment opportunities. Currently, 100% of recent MS graduates in Statistics from AU are employed or pursuing their next degree (see [www.american.edu/weknowsuccess/](http://www.american.edu/weknowsuccess/)).

### CONTACT

AU MATH & STAT DEPARTMENT  
[www.american.edu/cas/mathstat/](http://www.american.edu/cas/mathstat/)

STATISTICS PROGRAM DIRECTOR  
Dr. Michael Baron, [baron@american.edu](mailto:baron@american.edu)

Contact any time for more information ☺



# MS DEGREE COMBINED WITH A GRADUATE CERTIFICATE

No additional cost or additional courses,  
with proper planning

Click to read [an article](#) about  
this MS + Certificate program

<https://www.american.edu/cas/mathstat/statistics-ms>

Contact: [baron@american.edu](mailto:baron@american.edu)

**Demand: Grads with MS Statistics Degree and Data Science Grad Certificate**

Combination degree and certificate designed to prepare students for data-driven careers

By Patty Housman | November 4, 2022

for students looking to launch data-driven careers across business and industry, health and medicine, government and law, or policy and advocacy, American University offers an innovative combination MS degree in Statistics + Graduate Certificate in Data Science.

While students work toward their Master of Science degree in Statistics, they can simultaneously earn a graduate certificate in Data Science. When they graduate, they are uniquely prepared for leadership roles in the development, research, and analysis of quantitative tools to turn ideas into intelligent, informed actions.

**In Demand: Job Opportunities and Career Paths**

Six months after earning an MS degree in Statistics, a full 100 percent of American University graduates are employed, in grad school, or both. This is not surprising: No matter the industry, every organization must be

the data business, and Statistics and Data Science specialists are highly in demand across all industries. According to US News and World Report, Information Security Analyst is the number one career of 2022. Data Scientist comes in at sixth best career, and Statistician comes in at

# *Masters Degree in Statistics*

*with Graduate Certificate in Data Science*

*American University Washington DC*

**1** Customized degree plans are tailored to meet your goals

**2** No extra courses: Certificate is integrated within the MS program

**3** Financial support packages are available

Two tracks:

- Theory and Methods
- Biostatistics



Graduate program in the Nation's Capital



Research and internship opportunities

Active student clubs: networking, workshops, community events



Statistics + Data Science  
30 graduate credit hours

Rigorous training in Statistics



Practical courses in Data Science and Machine Learning



*Exceptional Employment Opportunities*



**CONTACT** for info and join our zoom sessions:

Michael Baron,  
MS program director  
[baron@american.edu](mailto:baron@american.edu)



# ACCELERATED BS-MS PROGRAM

How it works:

- Start taking relevant graduate courses during your undergraduate program at AU
- Share up to 9 credit hours between your BS and MS programs
- Graduate with MS degree in Statistics 1 year after receiving the BS degree

<https://www.american.edu/cas/mathstat/statistics-ms>

Contact: [baron@american.edu](mailto:baron@american.edu)



# DOUBLE-EAGLE SCHOLARSHIP

Guaranteed 30% tuition discount for your MS program in Statistics.

You are eligible if:

- You already have a degree from American University, and MS in Statistics is your second degree.
- You are not in an accelerated BS-MS program.

Details: <https://www.american.edu/provost/ogps/graduate-studies/double-eagle-graduate-scholarship.cfm>

If you weren't able to take advantage of the Bachelor's/Master's Combined Degree Program at AU undergrad, you still have the opportunity to leverage your AU bachelor's degree toward pursuing your master's. Build on your bachelor's degree at the place that knows you best. AU graduates are eligible to receive tuition savings when enrolling in an AU graduate program.

**Double Eagle Graduate Scholarship**

**Policy**

- Guaranteed 30% tuition discount, inclusive of any credit sharing, on eligible graduate degree programs.
- Students with a credit share via the bachelor's/master's programs save the tuition from the credit share while also saving time to complete the degree.
- Students with a credit share that equates to a discount of greater than 30% will get the full credit share value.
- The tuition remission scholarship dollars associated with the Double Eagle Graduate Scholarship will be applied over the length of the degree.
- Take more challenging courses since you will be pursuing your bachelor's degree at the same time you begin your master's.
- Obtain a competitive edge in the job market.

**Eligibility**

- AU graduates are eligible; however, other restrictions may apply.
- Must be a new enrollee to a master's-level degree program.
- The Double Eagle Graduate Scholarship applies to eligible master's-level degree programs.
- Students eligible for tuition remission as an employee benefit at AU are not eligible for the Double Eagle Graduate Scholarship.

<https://www.american.edu/cas/mathstat/statistics-ms>

Contact: [baron@american.edu](mailto:baron@american.edu)

# SAMPLE

# DEGREE PLANS

<https://www.american.edu/cas/mathstat/statistics-ms>

Contact: *baron@american.edu*

# MS in Statistics (Theory & Methods track)

Course		Semester	Grade	Prerequisites
<i>Required core (12 hours):</i>				
STAT 615	Regression			Stat 614 Statistical Methods or equivalent
STAT 627	Statistical Machine Learning			Stat 615 Regression
STAT 630	Mathematical Statistics I			Three semesters of Calculus, generally
STAT 631	Mathematical Statistics II			Stat 630 Math Stat I
<i>Software (choose one, 3 hours):</i>				
DATA 612	Statistical Programming in R	A course in Python will be added soon		
STAT 625	Statistical Software (SAS)	Stat 614 Statistical Methods or equivalent		
<i>Data collection (choose one, 3 hours):</i>				
STAT 516	Design of Experiments			Stat 614 Statistical Methods or equivalent
STAT 605	Intro to Survey Sampling			Stat 614 Statistical Methods or equivalent
<i>Capstone options (6 hours, thesis or nonthesis options)</i>				
STAT 690	Independent Project			Department permission, register via a signed form
STAT 691	Internship in Statistics			Department permission, register via a signed form
STAT 797	Master's Thesis Research			Department permission, register via a signed form
STAT 798	Research & Consulting			Department permission, register via a signed form
<i>Other electives (500 or 600 level courses in STAT or DATA, 6 hours)</i>				
STAT xxx	Choose courses in Statistics, Machine Learning, Artificial Intelligence, Data Science, to match your interests and career goals			
STAT xxx				
DATA xxx				

Total credit hours = 30 ( ~ 10 graduate courses )

Typical duration = 16 to 21 months. Part-time enrollment is possible.

# MS in Statistics (Biostatistics track)

Course		Semester	Grade	Prerequisites
<i>Required core ( 15 hours):</i>				
STAT 615	Regression			Stat 614 Statistical Methods
STAT 622	Advanced Biostatistics			Stat 614 Statistical Methods
STAT 623	Topics in Biostatistics			Repeatable for credit, on a different topic
STAT 630	Mathematical Statistics I			Three semesters of Calculus, generally
STAT 631	Mathematical Statistics II			Stat 630 Math Stat I
<i>Biology elective ( 3 hours )</i>				
BIO 68x	BIO-685 Bioinformatics, or BIO-687 Principles of Genomics, or BIO-689 Biotechnology, or.			
<i>Capstone options ( 6 hours , thesis or nonthesis options)</i>				
STAT 690	Independent Project			Department permission, register via a signed form
STAT 691	Internship in Statistics			Department permission, register via a signed form
STAT 797	Master's Thesis Research			Department permission, register via a signed form
STAT 798	Research & Consulting			Department permission, register via a signed form
<i>Choose a focus and 6 hours :</i>				
<i>Health Policy Focus</i> - 6 hours from COMM 580, ENVS 665, HLTH 575, 585, 661, 670, PUAD 604, 685, 696, SIS 624, 626, 628, 635				
<i>Computational Focus</i> - 6 hours from CSC 589, 610; ITEC 616, 620, 660, 670; MATH 660, 665; SIS 646; STAT 612, 625, 627				
<i>Management Focus</i> - 6 hours from ACCT-600, COMM-543, FIN-630, ITEC-616, ITEC-620, ITEC-660, MKTG-612, PUAD-685, SIS-628, SIS-635, SIS-646				
<i>Or choose electives (500 or 600 level courses in STAT or DATA, 6 hours )</i>				
STAT xxx	Choose courses in Statistics, Biology, Health Studies, Machine Learning, Artificial Intelligence, Data Science, to match your interests and career goals			
DATA xxx				

**Total credit hours = 30 ( ~ 10 graduate courses )**

**Typical duration = 16 to 21 months. Part-time enrollment is possible.**

# Graduate Certificate in Data Science

Course		Prerequisites
<i>Each following course is required (12 credit hours)</i>		
STAT 615	Regression	Stat 614 Statistical Methods
DATA 612	Statistical Programming in R	Stat 614 or two Math/Stat courses 200+ level
DATA 613	Data Science	DATA 412/612
STAT 627	Statistical Machine Learning	STAT 415/615 or STAT 520
STAT 614	Statistical Methods	<i>Pre-requisite for the program</i>

**Total courses = 4**

**All 4 courses can be shared between the Certificate and the MS degree**

**You graduate as a certified professional in Data Science**

# Graduate Certificate in Applied Statistics

Course		Prerequisites
<i>Each following course is required (6 credit hours)</i>		
STAT 615	Regression	Stat 614 Statistical Methods
STAT 605	Survey Sampling	Stat 614 Statistical Methods
<i>Electives (6 credit hours) - approved graduate courses in Statistics</i>		
STAT ____	Choose courses in Statistics, Biostatistics, Machine Learning, Artificial Intelligence, Data Science, to match your interests and career goals	
STAT ____		

**Total courses = 4**

**All 4 courses can be shared between the Certificate and the MS degree**

**You graduate as a certified professional in Applied Statistics**

# OUR STUDENTS

<https://www.american.edu/cas/mathstat/statistics-ms>  
Contact: *baron@american.edu*

# STUDENT CLUBS



- Student Chapter of ASA  
Advisor: Betty Malloy
- Girls Who Code  
Advisor: Donna Dietz
- Not Math Club  
Advisor: Mike Limarzi

<https://www.american.edu/cas/mathstat/student-clubs.cfm>

<https://www.american.edu/cas/mathstat/statistics-ms>

Contact: [baron@american.edu](mailto:baron@american.edu)



## American Statistical Association @ American University

Join Us: Be part of an innovative community driving the future of data science, emerging technologies at AU.

*Grow, Learn, Lead. Together* 🎓🌐🎓



AU Statistics & Data Science Club  
Unlock Your Future in STEM



Why Join?

- Empower Your Skills: Leadership, teamwork, and decision-making 🧑‍💻🌟📈.
- Expand Networks: Connect with industry professionals.
- Learn & Grow: Workshops and talks by industry experts.
- Build Your Career: Add valuable experience to your resume and build your portfolio.

About Us:

- Founded in January 2022 by AU's brightest in Mathematics and Statistics.
- The largest, most active STEM community at AU.

What We Offer:

- Expert Insights: Stay ahead with the latest trends and technologies, fostering out of your classroom.
- Hands-On Experience: Real-world projects 🚗💻 with a tangible impact.
- AU-ASA STEM community: An opportunity that serves as a hub to connect, exchange knowledge, and collaborate with other AU students.

<https://www.american.edu/cas/mathstat/student-clubs.cfm>

<https://www.american.edu/cas/mathstat/statistics-ms>

Contact: [baron@american.edu](mailto:baron@american.edu)



A guide to interview preparation workshop



Internship Event



Data Visualization workshop



AU-ASA at Club Involvement fair

<https://www.american.edu/cas/mathstat/student-clubs.cfm>

<https://www.american.edu/cas/mathstat/statistics-ms>

Contact: [baron@american.edu](mailto:baron@american.edu)



join AU  
GWC today!

## WHO IS GWC?

AU Girls Who Code is a chapter of the national GWC movement, which aims to empower individuals to pursue careers in tech and provide a community for like minded individuals who are excited to explore where coding skills can be used in their desired fields!

Our chapter is a community of women, gender non-conforming, and all underrepresented individuals who are interested in empowering each other and closing the gender gap in tech.

## OUR MISSION

We are currently working towards building a GWC chapter at AU in order to foster a safe, supportive community for those interested in coding; whether it be in the field of computer science or a general interest!

Do you have coding experience? Are you interested in learning to code or exploring how coding can enhance your career? Join GWC to find your community at AU! No experience necessary!



## MAILING LIST

Scan this QR code for information on upcoming events, meetings, and more!



## connect with us!

instagram



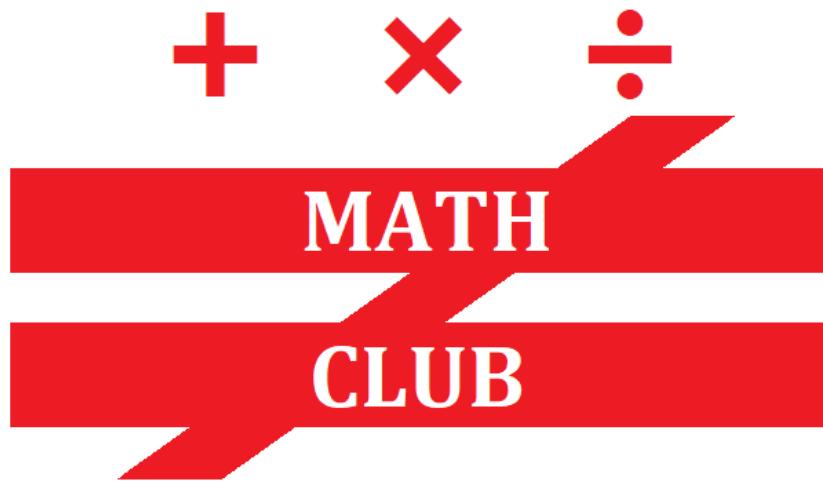
discord



Feel free to reach out to us at [augirlswhocode@gmail.com](mailto:augirlswhocode@gmail.com) with any questions, comments, or concerns!

# Want to be a part of the coolest club at AU?

If not, then you should join

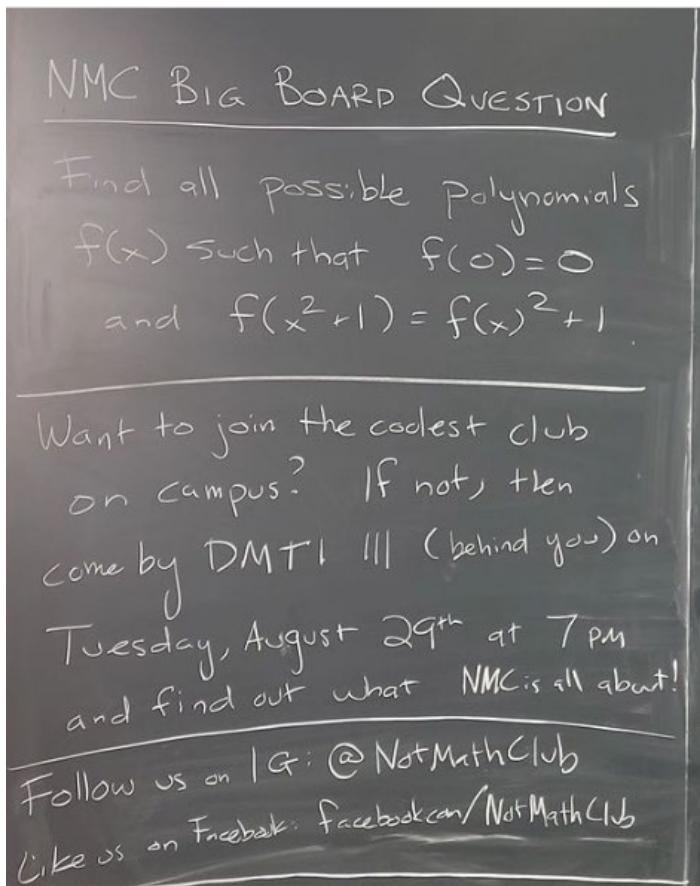


**Not Math Club!**

Meetings on Mondays at 7PM in DMTI 111.

We take math seriously. But not too seriously.

# NOT MATH CLUB



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Meets: Mondays @ 7 pm in room DMTI-111

Faculty advisor: Mike Limarzi

<https://www.american.edu/cas/mathstat/student-clubs.cfm>

<https://www.american.edu/cas/mathstat/statistics-ms>

Contact: [baron@american.edu](mailto:baron@american.edu)

# RESEARCH OPPORTUNITIES



## Selected Summer Project Examples



**Eyerusalem Abebe**

"Analysis of graphical models using sheaves"

Supervisor: Michael Robinson



**Jacqueline Adams**

"Macrophages and Iron Phenotypes in Cancer"

Supervisor: Julia Chifman



**Casey Aguilar-Gervase**

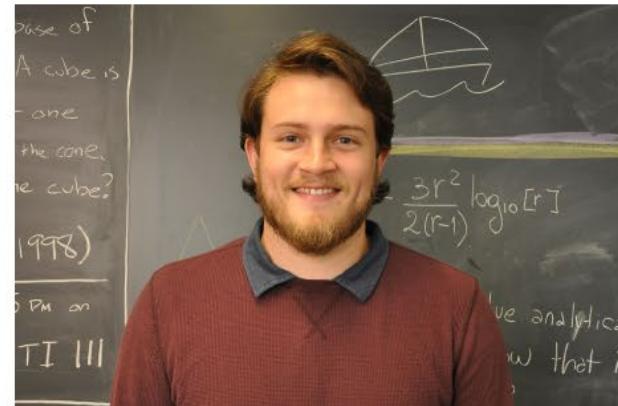
"Gene interactions, order perturbations and algorithms"

Supervisor: Kristina Crona

<https://www.american.edu/cas/mathstat/statistics-ms>

Contact: [baron@american.edu](mailto:baron@american.edu)

# RESEARCH OPPORTUNITIES



**Tonia Bell**

"Gene interactions, rank orders and hyperplane arrangements"

Supervisor: Kristina Crona

**Payal Dudhedia**

"Antibiotic resistance, order perturbations and cube graphs"

Supervisor: Kristina Crona

**Mario Ego-Aguirre**

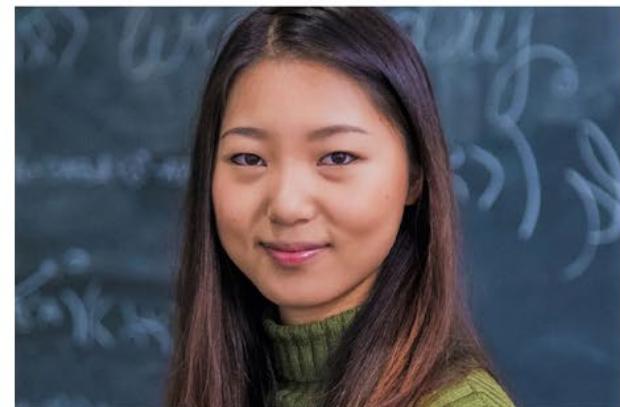
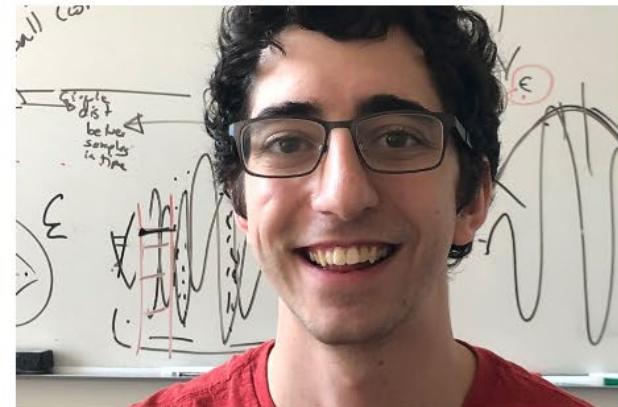
"Slices of Pi"

Supervisor: Kenneth Ward

<https://www.american.edu/cas/mathstat/statistics-ms>

Contact: [baron@american.edu](mailto:baron@american.edu)

# RESEARCH OPPORTUNITIES



**Robby Green**

"Acoustic simulation and experiments of percussive musical instruments"  
Supervisor: Michael Robinson

**Joe Kelly**

"Acoustic simulation and experiments of percussive musical instruments"  
Supervisor: Michael Robinson

**Fangfei Lan**

"Acoustic simulation and experiments of percussive instruments"  
Supervisor: Michael Robinson

<https://www.american.edu/cas/mathstat/statistics-ms>

Contact: [baron@american.edu](mailto:baron@american.edu)

# RESEARCH OPPORTUNITIES



**Moriah Mitchell**

"Involvement of iron in cell cycle"

Supervisor: Julia Chifman



**Metin Toksoz-Exley**

"Biological Networks and Generative Graphs"

Supervisor: Michael Robinsson



**Greg Young**

"Acoustic simulation and experiments of

percussive musical instruments"

Supervisor: Michael Robinson

<https://www.american.edu/cas/mathstat/statistics-ms>

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# RESEARCH OPPORTUNITIES

## Meet a Researcher

Tonia Bell



### **Why did you want to do a research project?**

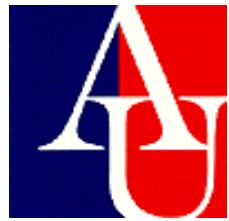
I wanted to do a research project so that I could take what I learned in the classroom and see how it applies to real life situations. Seeing what you study theoretically apply in reality is a very rewarding experience that makes all the hours spent studying feel worthwhile.

### **What do you research?**

I researched additivity in biological systems. Since any organism will adapt to better fit its surroundings, one can look at the genome and observe where mutations occur. Additive systems are those in which mutations contribute to fitness independently. By using weight vectors and hyperplane arrangements, we were able to find all rank orders of genotypes that could be compatible with additive fitness in four locus systems. We used our results for analyzing malaria drug resistance.

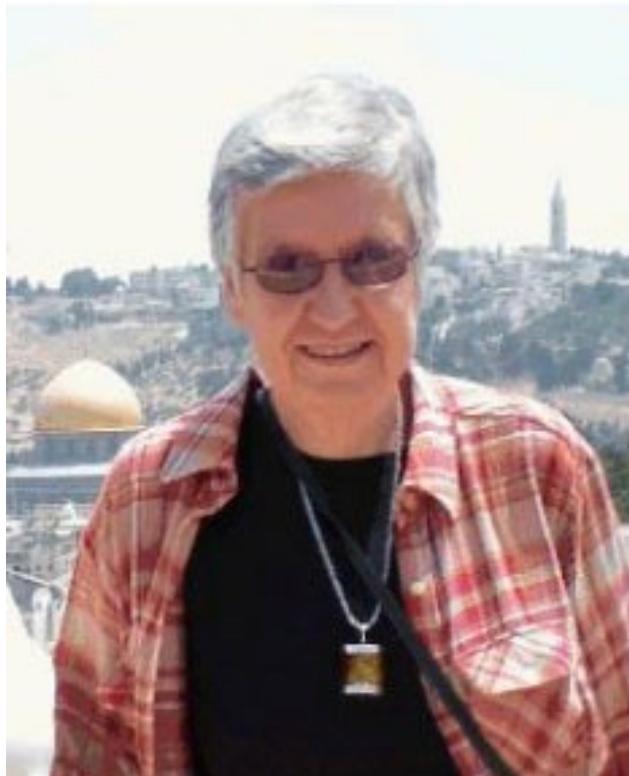
# OUR FACULTY AND THEIR RESEARCH

<https://www.american.edu/cas/mathstat/statistics-ms>  
Contact: *baron@american.edu*



AMERICAN UNIVERSITY  
WASHINGTON, D.C.  
DEPARTMENT OF MATHEMATICS AND STATISTICS

## Meet the Statistics Research Faculty!

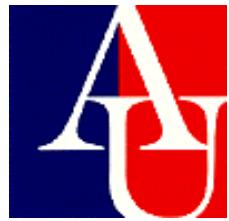


*Dr. Mary Gray*

*Applications of  
statistics to human  
rights, economic  
equity, and education*

<https://www.american.edu/cas/mathstat/statistics-ms>

Contact: [baron@american.edu](mailto:baron@american.edu)



AMERICAN UNIVERSITY  
WASHINGTON, D.C.  
DEPARTMENT OF MATHEMATICS AND STATISTICS

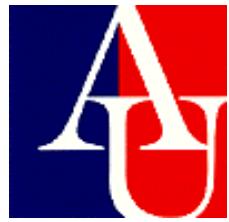
## Meet the Statistics Research Faculty!



*Dr. Monica Jackson*  
*Spatial statistics focusing  
on detecting global  
clustering patterns and  
outliers for disease  
surveillance.*

<https://www.american.edu/cas/mathstat/statistics-ms>

Contact: [baron@american.edu](mailto:baron@american.edu)



AMERICAN UNIVERSITY  
WASHINGTON, D.C.  
DEPARTMENT OF MATHEMATICS AND STATISTICS

## Meet the Statistics Research Faculty!

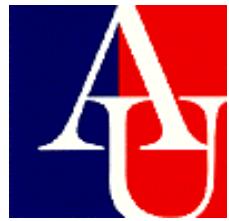


*Dr. Zoís  
Boukouvalas*

*Interpretable machine learning models and algorithms for the analysis of big multi-modal data, by combining aspects from information geometry, mathematical statistics, and numerical optimization.*

<https://www.american.edu/cas/mathstat/statistics-ms>

Contact: [baron@american.edu](mailto:baron@american.edu)



AMERICAN UNIVERSITY  
WASHINGTON, D.C.  
DEPARTMENT OF MATHEMATICS AND STATISTICS

## Meet the Statistics Research Faculty!

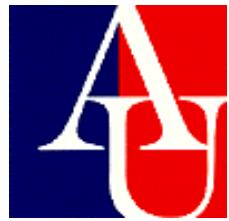


*Dr. Maria  
Barouti*

*Data mining by identifying  
patterns in big data sets  
as well as developing  
feature selection  
algorithms*

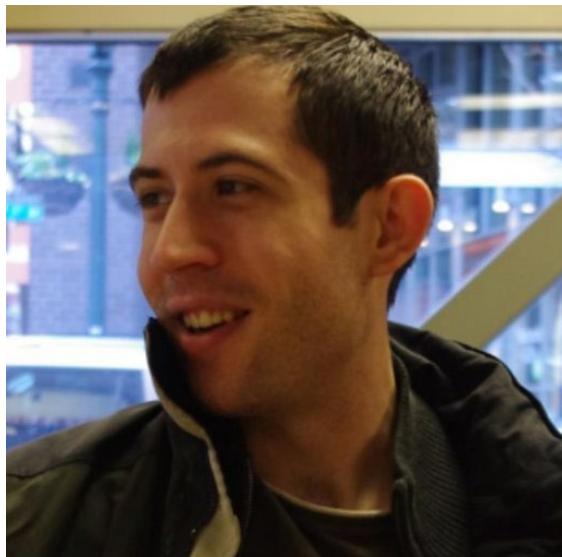
<https://www.american.edu/cas/mathstat/statistics-ms>

Contact: [baron@american.edu](mailto:baron@american.edu)



AMERICAN UNIVERSITY  
WASHINGTON, D.C.  
DEPARTMENT OF MATHEMATICS AND STATISTICS

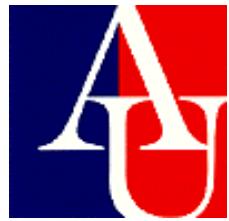
## Meet the Statistics Research Faculty!



*Dr. David Gerard*  
*Statistical genetics.*  
*Bayesian analysis of the next-generation sequencing data.*  
*Application of tensor methods to biological data*

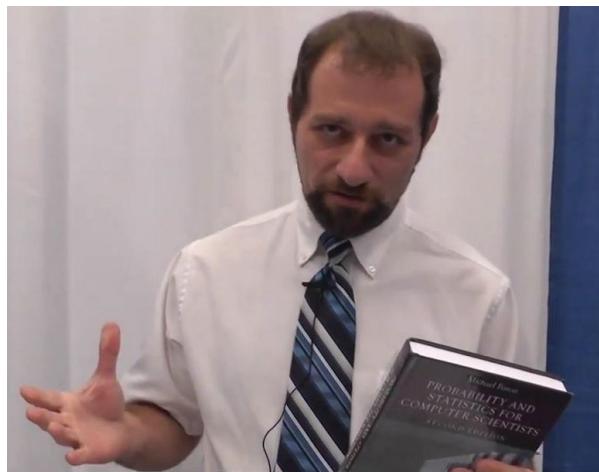
<https://www.american.edu/cas/mathstat/statistics-ms>

Contact: [baron@american.edu](mailto:baron@american.edu)



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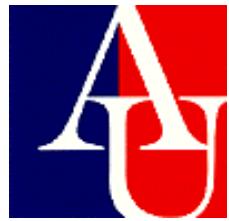
## Meet the Statistics Research Faculty!



*Dr. Michael Baron*  
*Sequential Analysis;*  
*Change-Point Detection;*  
*Bayesian inference; Multiple*  
*Comparisons; Applications in*  
*Clinical Trials, Epidemiology,*  
*Insurance, and Finance.*

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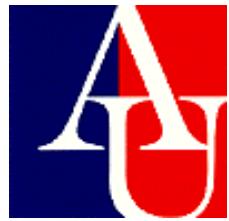


*Dr. Alexandra  
Kapatou*

*Quality and process control;  
design of experiments with  
applications to clinical trials;  
risk analysis, especially as  
applied to food safety.*

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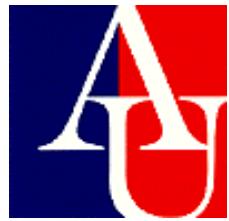


*Dr. Jun Lu*

*Bayesian methods and applications,  
interdisciplinary statistical applications, consulting,  
and statistical education.*

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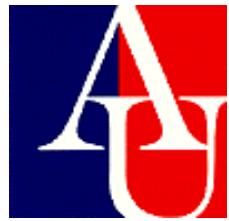
## Meet the Statistics Research Faculty!



*Dr. Betty Malloy*  
*Functional data analysis,  
biostatistics, and semiparametric  
regression, with applications in  
environmental statistics,  
occupational health, psychology,  
and other areas.*

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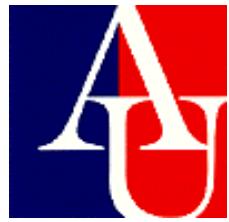
*Dr. John Nolan*

*Probability theory, heavy tailed  
stable and extreme value  
distributions.*

*Analysis of these models is based on  
mathematical theory, computational  
geometry, and numerical methods*

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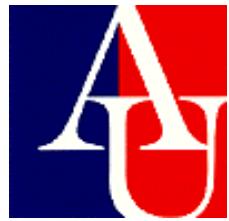


*Julia Chifman*

*Systems biology and its application to molecular networks, estimation of species-level phylogenies using novel mathematical techniques, and application of methods from evolutionary biology to cancer evolution.*

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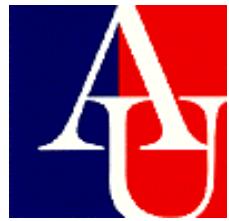
## Meet Our Faculty!



*Richard Ressler*  
*Responsible data science  
and the application of  
ethical approaches in data  
science.*

<https://www.american.edu/cas/mathstat/statistics-ms>

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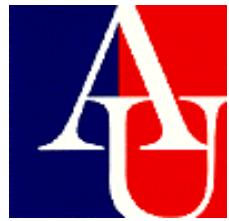


*Michael Robinson*

*Signal processing, dynamics,  
and applications of topology.  
Radio propagation and  
network planning, bistatic  
radar processing, and  
advanced radar simulation.*

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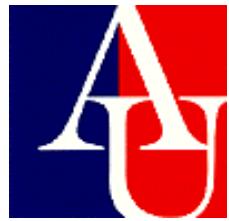


*Ahmad Mousavi*

*Sparse Optimization, Machine Learning, Large Scale Optimization, Mathematical Modeling, and Numerical Linear Algebra*

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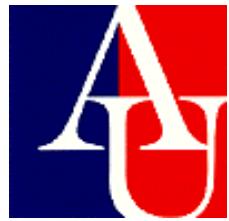


### *Dr. Jeff Gill*

*Gill's research interests are numerous – ranging from political behavior and institutions to statistical computing, Bayesian inference, blood/circulation, cancer epidemiology, and pediatric traumatic brain injury.*

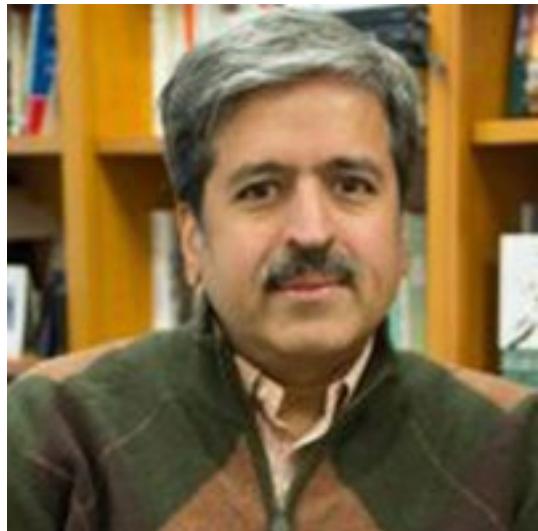
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## Meet the Statistics Research Faculty!



### *Dr. Nimai Mehta*

*As an economist and statistician, Professor Mehta's area of research is on the quality and use of data under varying institutional contexts. He is the lead coordinator of a multidisciplinary effort at the university to employ data-science, economics, and machine-learning to improve data on missing and exploited children.*

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# **EMPLOYMENT OPPORTUNITIES**

<https://www.american.edu/cas/mathstat/statistics-ms>

Contact: *baron@american.edu*

# EMPLOYMENT OPPORTUNITIES

- What do the statisticians do?

Statisticians collect, analyze, and interpret data

- Who needs their work?

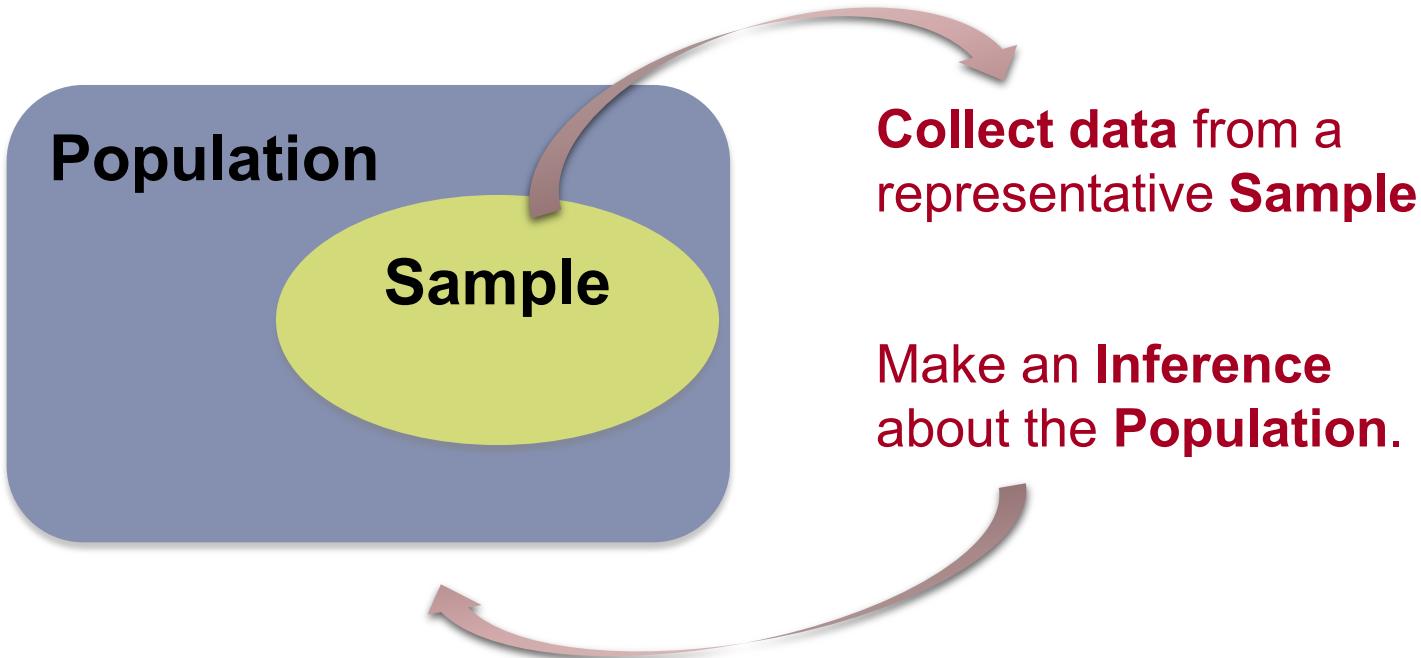
“The world is becoming quantitative. More and more professions, from the everyday to the exotic, depend on data and numerical reasoning.”

*American Statistical Association*

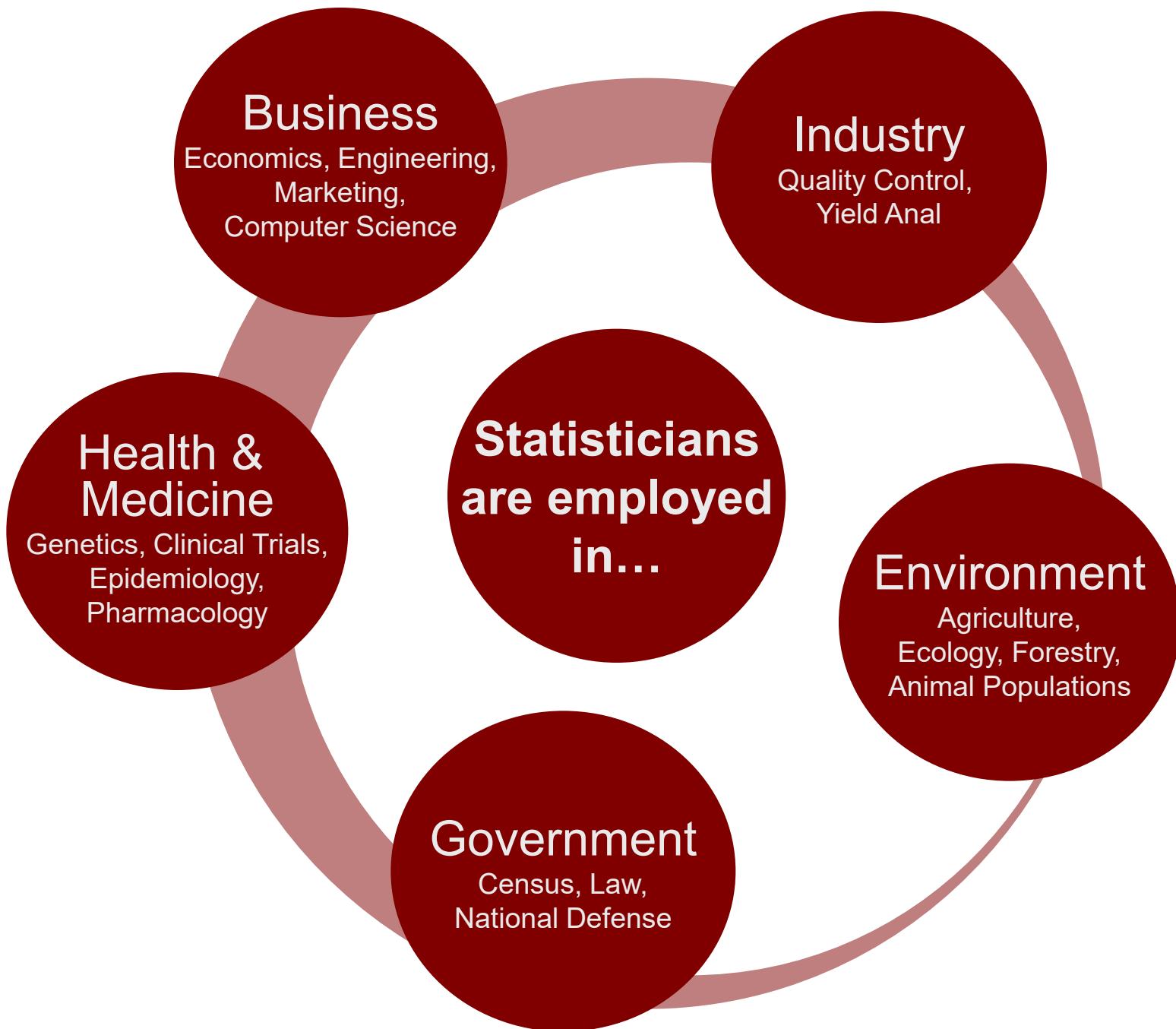
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Contact: *baron@american.edu*

# Working as a statistician is always making discoveries

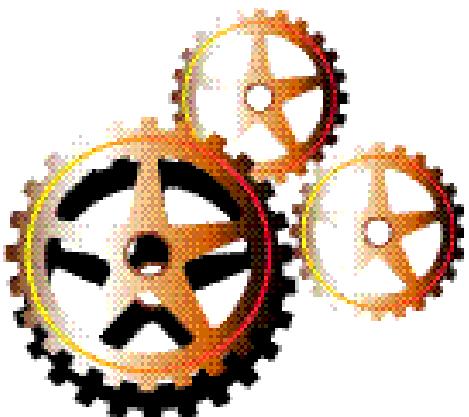


- Collect data
- Turn data into useful information
- Make conclusions about the whole population



# Business and Industry

- **Manufacturing**
  - Test quality, predict yield, determine root causes and their effect
  - Identify factors that impact customer satisfaction and the company's profit



# Business and Industry

- **Marketing**
  - Design experiments for new products, conduct sample surveys, and perform field experiments to determine product viability



# Business and Industry

- **Engineering**
  - Make a consistent product, detect problems, minimize waste, and predict product life in electronics, chemicals, aerospace, pollution control, construction, and other industries



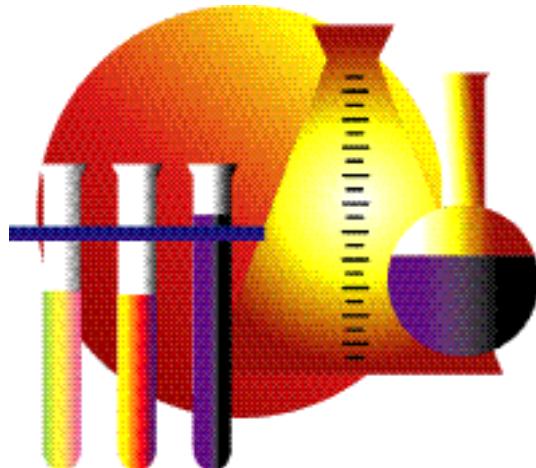
# Business and Industry

## Statistical Computing

- Work in software design and development, testing, quality assurance, technical support, education, marketing, and sales to develop code that is both user-friendly and sufficiently complex



# Health and Medicine



- **Epidemiology**
  - Work on calculating disease incidence rates, monitor outbreaks, and detect changes in health-related behaviors such as smoking and physical activity

# Health and Medicine



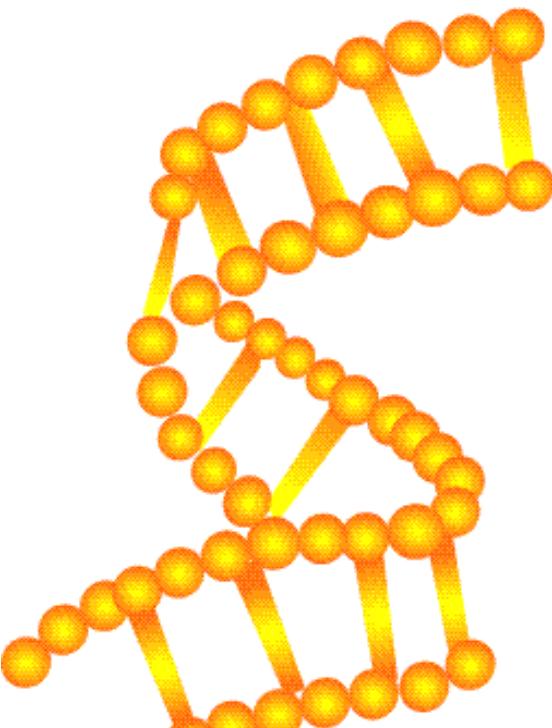
- **Public Health**
  - Prevent disease, prolong life, and promote health through organized community efforts, including sanitation, hygiene education, diagnoses, and preventative treatment

# Health and Medicine

- **Pharmacology**
  - Work in drug discovery, development, approval, and marketing, to ensure the validity and accuracy of findings at all stages of the process



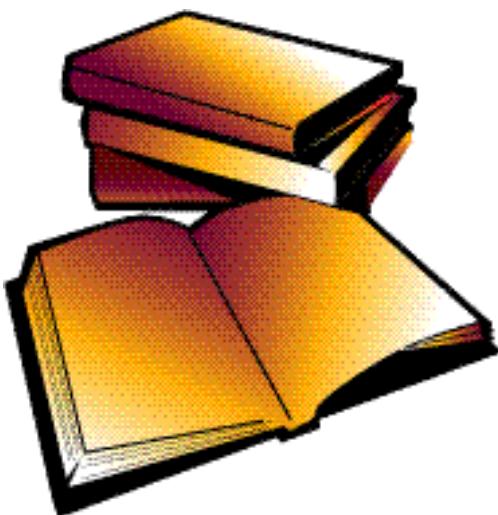
# Health and Medicine



- **Genetics**
  - Label possible indicators of genetic abnormalities, such as birth defects and early aging, or breed desirable characteristics in plant offspring

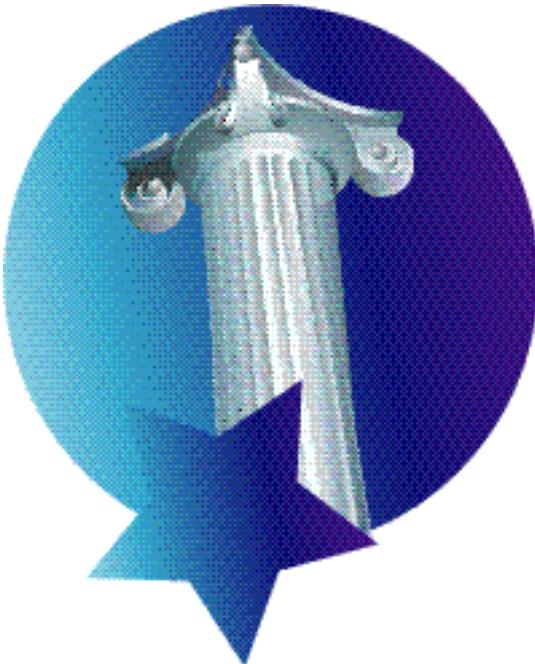
# Learning

- **Science Writing & Journalism**
  - Work with mass media, universities, and corporations to produce news briefs, articles, news releases, and other reports



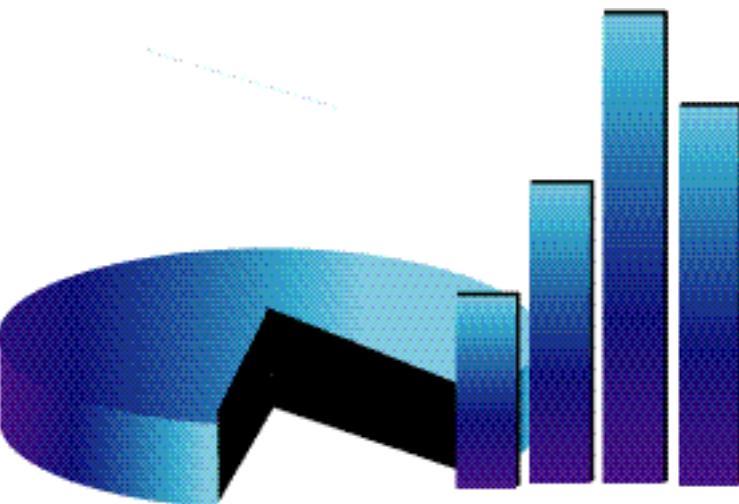
# Research

- **Government**
  - Work in regulations for stock trading, pollution, and drug approvals, or testify in court proceedings, congressional hearings, and lobbying arguments



# Research

- **Survey Methods**
  - Collect data in the social sciences, education, law, forestry, agriculture, biology, medicine, business, and e-commerce, and for the government



# Social Statistics

- **Law**

- Analyze data in court cases, including DNA evidence, salary discrepancies, discrimination law suits, and disease clusters

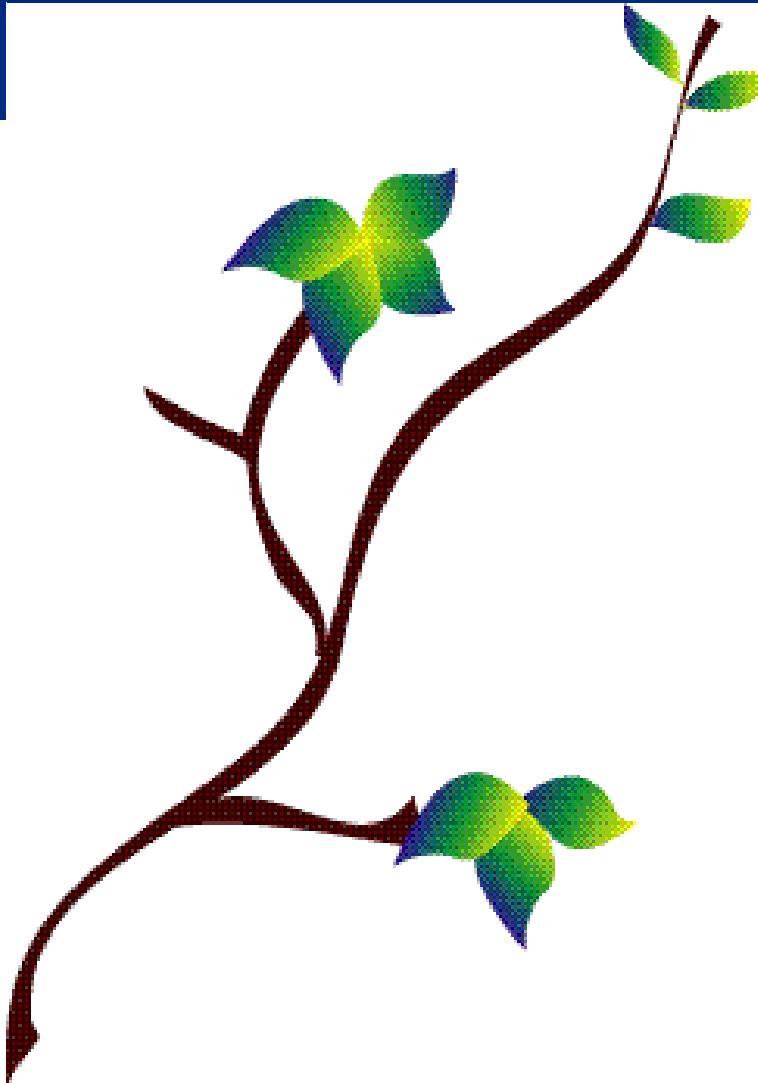


# Social Statistics

- **Consulting**
  - Work on a temporary basis on a variety of projects including quality improvement, pharmaceuticals, ecology, and engineering



# Natural Resources



## Agriculture

- Study chemical pesticides, hydrogeology, veterinary sciences, genetics, and crop management in order to ensure optimal yield

# Natural Resources



- **Ecology**
  - Address questions about the earth's natural environment, including animal populations, agricultural protections, and fertilizer and pesticide safety

# Opportunities around Washington DC



- The federal government employs 20% of the approximately 19,000 statisticians in the United States.
- Data collected and analyzed by statisticians in the federal government are used to make important policy decisions.
- Statisticians are employed in nearly every federal agency, offering a large variety of opportunities.
- The federal government employs statisticians with bachelor's, master's and Ph.D. degrees.



# U.S. Food and Drug Administration

- Non-laboratory setting
  - Review and evaluate new drug applications
- Research setting
  - Design and analyze complex short term and long term studies

# Bureau of Labor Statistics



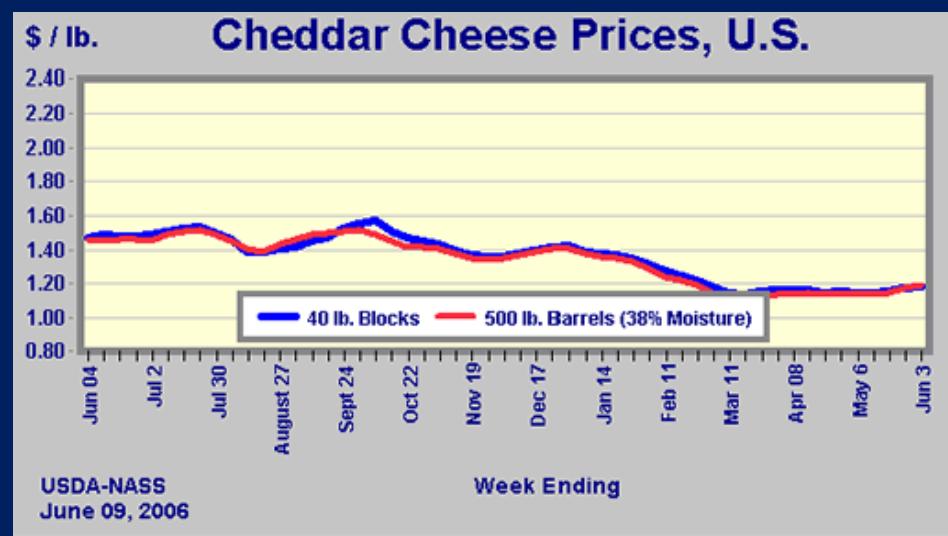
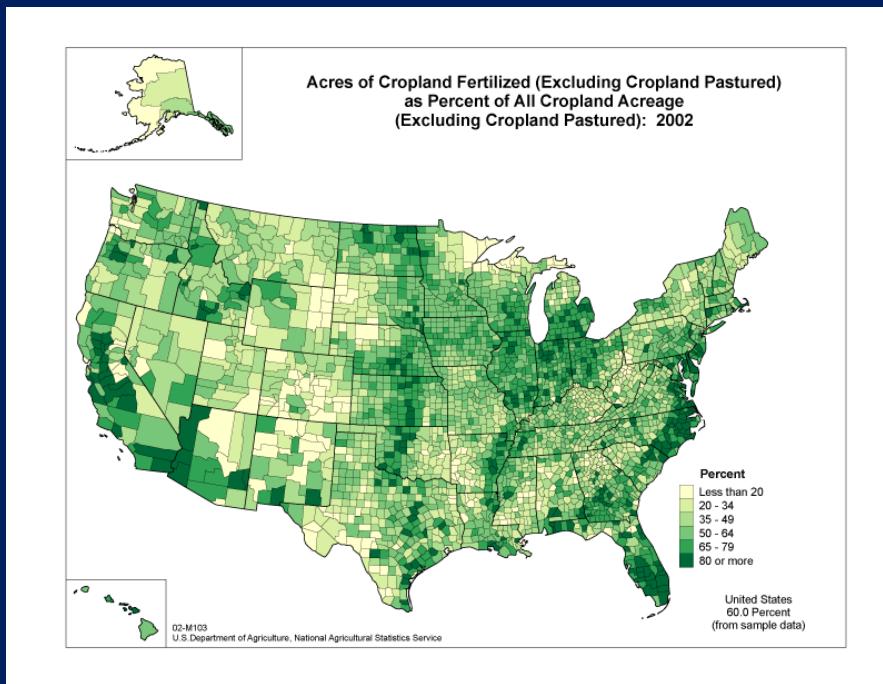
- Produce important economic indicators such as the Unemployment Rate and the Consumer Price Index

# U.S. Department of Agriculture



- Agricultural Statisticians
  - Produce seasonal estimates of crops
  - Use survey statistics, mathematical statistics, and data processing to prepare data relating to many areas of agriculture
- Mathematical Statisticians
  - Research and evaluate the theory and statistical programs used in studies applied to various agricultural survey activities

# What statistics does the USDA Produce?



Maps detailing the acres of farmland fertilized

Charts showing the price of cheddar cheese



# U.S. Census Bureau

- Statistician (Concentration on Social Science)
  - Design, implement, analyze and report on surveys of important population trends
- Statistician (Concentration on Economics)
  - Collect information from retailers on the amount of retail trade
- Mathematical Statistician
  - Develop new statistical methodologies and perform innovative research to solve statistical problems

# National Institutes of Health



Design clinical trials,  
analyze large datasets  
coming from genetics,  
DNA sequencing, MRI,  
fMRI, and other  
medical diagnostics  
tools, etc.





# Centers for Disease Control and Prevention



CDC employs statisticians to design both laboratory and epidemiologic studies and analyze the data from individual projects.

# CONTACT INFORMATION

**AMERICAN UNIVERSITY MATHEMATICS & STATISTICS DEPARTMENT**

<https://www.american.edu/cas/mathstat/statistics-ms/>

**PROGRAM DIRECTOR, MS in STATISTICS**

Dr. Michael Baron, [baron@american.edu](mailto:baron@american.edu)

**WEEKLY Ask-Me-Anything ZOOM SESSIONS ABOUT MS in STATISTICS:**

<https://american.zoom.us/j/95868480371> - every Monday at 12 noon

**APPLY to the PROGRAM:**

<https://www.american.edu/cas/admissions/apply.cfm>