

The logo features a central white circle with the text "Duke | Statistical Science" in a serif font. This circle is surrounded by a complex, colorful pattern of concentric rings and radial lines, each composed of many small, multi-colored rectangular segments in shades of blue, yellow, red, and purple, creating a mosaic-like effect.

Duke | Statistical Science

Graduation with Distinction Senior Thesis Information Fall 2021

Who can help?

Prof. of the Practice Mine Çetinakaya-Rundel, DUS - signs off on everything related to the thesis, chairs the honors committee!

Mrs. Karen Whitesell, DUS Assistant - help with independent studies enrollment and reimbursement of grant funds

Assistant Prof. of the Practice Maria Tackett -- PI of our Research Enhancement Grant, expert advice on finding people and resources on campus, experienced research mentor

Dr. Joan Combs Durso, Coordinator of Undergraduate Training, Research, and Development - scheduling, applications, slides, resources

Jodi Psoter, Duke University Librarian for Chemistry and Statistical Science - schedule research consult, learn to use the databases, get great advice!

Graduation with Distinction = non-Latin honors

- Governed by Trinity College policies here:
<https://trinity.duke.edu/undergraduate/academic-policies/gwd>
- And by StatSci Departmental policies:
<https://stat.duke.edu/undergraduate/graduation-distinction>
- Eligibility determined by GPA:
 - Overall GPA at least 3.3
 - StatSci GPA at least 3.5 and maintained until graduation

Types of GWD

- **Distinction in the Major or Program II:** Successfully completing a thesis in one major or your Program II subject
- **Distinction - Double Honors** for a Single Thesis Written for Two Separate Departments/Programs: Satisfy 2 committees with one thesis
- **Distinction (outside of the Major):** Completing a thesis in your minor or certificate or any other program with faculty that will host your work
- **Distinction: Interdepartmental Major (IDM)** governed by rules here:
<https://trinity.duke.edu/sites/trinity.duke.edu/files/degree-requirements/IDM-Graduation%20with%20Distinction.pdf>

Timeline - earlier is always better

- Start in junior year if you aren't already a senior!
- Attend an info session
- Find your advisor and write a research proposal
- Apply before last week of classes in fall semester if spring graduation planned
- Identify your committee before end of January
- No Later than 1 March, schedule your defense seminar with your committee and Dr. Durso and inform us of your defense seminar date/location/Zoom
- Departmental poster session TBD, approx. Friday 25 March
- Completed version of thesis due to department and committee by Sunday, March 27th; earlier is better
- Defense seminar to be held before April 15th; the public will be invited
- Final version with any corrections due by April 15th to department
- Upon acceptance by committee, deposit to library archives before beach week; negotiate embargo with your committee if needed

Finding your thesis advisor and topic: Connect in StatSci

- Your major advisor could be your thesis advisor.
 - What are they working on?
 - Have you talked with them about your interest in an honors thesis?
 - Who do they suggest? Have you flunched them to find out?
- What about your course professors?
 - Did you have conversations with them? Do they know who you are?
- Talk to your grad TAs. Find out what their interests are and their research team; ask if there are undergrads on the team.
- Talk to the DUS and the Department Chair
- Check out the research interests of our faculty:
<https://stat.duke.edu/research/theory-methods-computation>
- Find their office hours, publications, and grants at scholars.duke.edu

Finding your thesis advisor and topic: scholars.duke.edu

Maria Tackett

Assistant Professor of the Practice of Statistical Science

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Current Appointments & Affiliations

- Assistant Professor of the Practice of Statistical Science, [Statistical Science](#), [Trinity College of Arts & Sciences](#) 2018

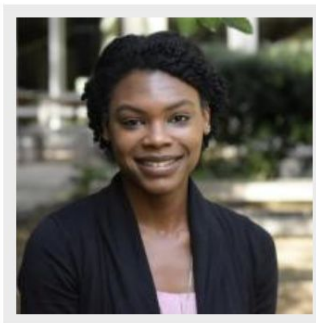
Contact Information

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🔗 [Personal site](#)



Scholars.duke.edu is a great place to start.



Simon Mak

Assistant Professor

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[Duke University](#)

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[Google Scholar](#), [Curriculum Vitae](#)

Education

- Ph.D. in Industrial Engineering at Georgia Institute of Technology (2010)
- M.Sc. in Statistics at Georgia Institute of Technology (2009)
- B.Sc. in Statistics at Georgia Institute of Technology (2008)

About me

I am an **Assistant Professor** in the [Department of Statistical Science](#) at Duke University. Prior to Duke, I was a Postdoctoral Fellow in the [Department of Industrial & Systems Engineering](#) at Georgia Tech.

My research involves integrating **domain knowledge** (e.g., scientific theories, mechanistic models, financial principles) and statistical learning for inference and prediction. This gives a holistic framework for **interpretable** statistical learning, providing a principled way to integrate domain knowledge and data.

Finding your thesis advisor and topic:
Check out faculty websites!

Finding your
thesis advisor and
topic: Department
Research profiles:
<https://stat.duke.edu/research/reiter>

Jerome P. Reiter

Professor of Statistical Science

I have three primary areas of methodological research:

The first is statistical disclosure limitation, i.e., how statistical agencies and other data producers can disseminate or share data that protect the confidentiality of data subjects' identities and sensitive attributes. I develop new approaches to confidentiality protection, including frameworks for obtaining valid inferences from data that have been altered to protect privacy. I develop methods that satisfy formal privacy guarantees, such as differential privacy. I also work to translate theory into practice, supervising or consulting on the creation of public use data products for government agencies.

My second main area of methodological research is missing data methods, in particular multiple imputation (MI). In MI, we fill in the missing values with multiple draws from probability distributions. I develop frameworks for handling complicated missing data scenarios, including nonignorable missing data, data fusion (also known as statistical matching), and methods for automatic editing of measurement errors. An integral component of my research is adapting the multiple imputation framework -- originally developed for missing data imputation in large sample surveys -- to handle methodological problems in other contexts.

My third main area of methodological research is combining information from different data sources. This includes methods for propagating uncertainty in downstream inferences when using inexact linked data files, as well as methods for fusing information in convenience samples with information in traditional surveys.



Finding your thesis advisor and topic: LinkedIn profiles



Merlise Clyde
Professor at Duke University

Experience



Duke University
21 yrs



Professor
2011 – Present · 10 yrs

Research in Bayesian Model selection/model uncertainty. Nonparametric function estimation using wavelets, kernels, overcomplete representations via Levy random field priors. Applications in genetic association studies, astronomy, neuroscience, pollution modelling, mass spectroscopy.



Associate Professor
2000 – 2011 · 11 yrs

Education



University of Minnesota
PhD, Statistics
1988 – 1993



University of California, Riverside
Master of Science (MS), Statistics
1986 – 1988



Oregon State University
Bachelor of Science (BSc), Forestry
1980 – 1984

Finding the rest of your committee?

- Start by asking your thesis advisor AKA “committee chair”.
- Listen hard to who they suggest; Duke is collegial. Some people are too busy or have situations preventing their joining your committee
- Do your homework on their interests and try to understand how their research connects with yours and your advisor’s
- Go to those professors’ office hours or set up appointment and ask if they are taking on any more thesis committees
- Have your abstract ready!
- Do you have a PI in a lab where you work? Is it their research you are expanding? They should be on your committee but cannot chair if they don’t have an appointment in our department
- Double honors requires careful coordination and is easier if chair is in both departments; not required, however.

Professor & Potential Project Topics

David Banks

- Agent-based models
- Bayesian game theory
- Text Mining
- Dynamic Network Models

Mine Çetinkaya-Rundel

- Statistics and data science education
- Statistical computing
- Data visualization
- Spatial statistics

Cliburn Chan

- Computational immunology
- Statistical methodology for immunological laboratory

Sayan Mukherjee

- Statistics and genomics
- Statistical machine learning

Galen Reeves

- Signal processing, statistics, and information theory

Jerry Reiter

- Statistics in policy and government
- Methods for protecting data confidentiality
- Methods for handling missing data

Cynthia Rudin

- Machine learning and interpretability

Finding the rest
of your
committee:
[Research teams
list](#)

Research Independent study???

- STA 393R and STA 493R
- Use to save space and time in your schedule to work on thesis
- Often used in last semester
- One independent study may count as an elective in your major or minor
- Rules are here:
<https://stat.duke.edu/undergraduate/current-students/independent-study>
- If you need one more Writing code, fill out the paperwork with Trinity College
<https://trinity.duke.edu/undergraduate/academic-policies/research-independent-study-w-code>

Workshops and events to help you succeed

Intro to GWD in Statistics (this session)

Thursday October 21, 6-730 pm: Stats Librarian Jodi Psoter on Writing and Citing Research Literature Reviews

Duke CDVS on Reproducible Research - early November

Duke CDVS on Effective Posters Feedback - Spring

Peer feedback workshop on Slide Presentations plus *murder board* narrative consultation with Dr. Durso - Spring

Funding?

- Departmental efforts assisted by **Trinity Research Enhancement Grants**
- **Conference fees and travel expenses** can be reimbursed by competitive grants from the department:
<https://stat.duke.edu/conference-funding-research>
- **Poster printing** subsidized by departmental grants
- **Duke Undergraduate Research Support Office** Conference Grants, Independent Study Grants, Stipends:
<https://undergraduateresearch.duke.edu/opportunities>
- **Advisor or PI** may have some support funds to help support
- **Summer stipends** from Career Center

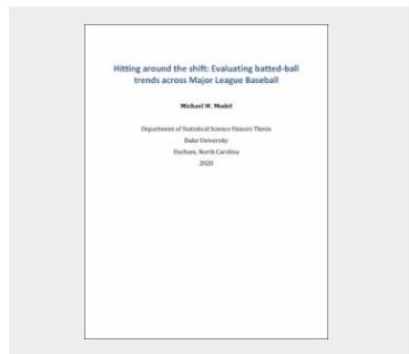


Presenting your work?

- Defend your work in your thesis seminar
- Departmental or Program Poster Session
- Duke Visible Thinking Undergraduate Research Symposium
- Duke Research Week Undergraduate Poster Fair
- [SNCURCS Annual Conference](#)
- Professional Conferences in the field of your research or with your advisor or PI
- Lab or team seminar
- Your advisor may suggest publication in peer-reviewed journals or undergrad research journals

Archive it!

Finding StatSci theses in the archives....



Hitting around the shift: Evaluating batted-ball trends across Major League Baseball

Model, Michael W. (2020-05)

Hitting around the shift: Evaluating batted-ball trends across Major League Baseball

Michael W. Model Department of **Statistical** Science Honors Thesis Duke University Durham, North Carolina 2020...

utilized by Jim Albert (2018). The formula behind the transformation can be found in the appendix. Batter-Tendency Data The pitch-level data was complemented by batter-tendency data from FanGraphs. FanGraphs' leaderboard contains cumulative **statistics...**

What's it like to do your GWD thesis?

Check out what alumni say about the experience

<https://stat.duke.edu/undergraduate/graduation-distinction>

2020 Graduates with Distinction



[Rose Graves](#)



[Chiwan Kim](#)



[Michael Model](#)



[Daniel Spottiswood](#)



[Michael Tan](#)



[Bricken & Jiang](#)

Responsible Conduct of Research

Undergraduate students in the department doing research should complete the CITI modules on [Undergraduate Student Responsible Conduct of Research](#).

Students completing [STA 393R or 493R Research Independent Study](#) must complete the modules and attend as well as document an RCR event.

Details on fulfilling this requirement [are here](#).

Awards?

- Departmental BEST award for Bayesian research
- Nominate your grad student mentor for the Outstanding Mentor of Undergraduate Research Award
- Enter your work in research competitions
- Present at conferences which may give awards

Next steps.....

If you have not yet filled out the thesis interest survey, please do so here:

[Senior Honors Thesis Plans as of Fall 2021 - Survey for Juniors and Seniors](#)

If you have questions about the GWD requirements or process, please email them to dus@duke.edu and we'll get back to you!