Grad School in Statistics at UMich: What's it like?

Daniel Iong
3rd year PhD Student in Statistics
UCD Statistics/Economics Alumni '17

Overview

1. **Graduate Programs offered in the UMich Department of Statistics**
    a. PhD program
    b. 3 Master's programs
        i. Master's in Applied Statistics
        ii. Master's in Data Science
        iii. Bridge Masters (for domestic student's only)
2. **My Personal Journey: Undergrad @ UCD -> PhD student @ UMich**
    a. Application Preparation
    b. Why I chose UMich
    c. Personal experience with PhD coursework, research, TA'ing @ UMich
3. **Advice for those interested in graduate studies**
4. **Questions**

Grad Programs - UM Dept. of Statistics

- **PhD Program**
  - Flexible program that allows students to pursue diverse interests, ranging from statistical methodology and interdisciplinary research to theoretical statistics/probability theory.
  - *Year 1/2*: core coursework, qualifying exam, exploring research interests, finding a dissertation advisor, being a GSI (otherwise known as TA)
  - *Year 3-5:* Research, GSI
  - **Suitable for those who:** want to pursue an academic career or a research-oriented career in industry, genuinely passionate about Statistics, want a strong theoretical background in Statistics

- **Master's in Applied Statistics**
  - 2 year program geared towards those who want to pursue careers as applied statisticians in industry, government, consulting firms, and research organizations.
  - **Prerequisites:** Good background in calculus (MAT 21 series), linear algebra (MAT 67/MAT 167), and has taken probability theory (STA 131A), theoretical statistics (STA 131B), and a course in applied statistics (STA 106/108/135/etc)

Grad Programs - UM Dept. of Statistics

- **Master's in Data Science**
  - New professional degree jointly offered by multiple departments (Statistics, EECS, etc), started in 2018
  - Students have the opportunity to take a good mix of both statistics and computer science courses
  - **Prerequisites:** 2 semesters (3 quarters) of college calculus (MAT 21A/B/C), 1 semesters of linear algebra (MAT 22A/67/167), 1 introduction to computing course (ECS10/30/40/etc)

- **Bridge Master's in Statistics (for domestic students only)**
  - Super new program that is being offered starting in 2020
  - Designed to prepare students who want to pursue a PhD in Statistics
  - **What distinguishes this degree from the Master's in Applied Statistics?**
    - Fully funded!!!
    - All students have the opportunity to complete a research-based project with a faculty member
    - Students who complete this program and meet certain academic requirements can be granted admission into the Statistics PhD program at UMich.

Personal Journey (Application Prep.)

- Majored in Statistics & Economics
- Participated in research projects
  - Completed a RTG research project with Prof. Hans Mueller on applying and developing functional data analysis methods for economics data
  - Wrote undergraduate thesis with Prof. Alexander Aue on applying methods for analyzing time series with missing data to pesticide data

- **Courses I took that prepared me for graduate studies:** Multivariate Data Analysis (STA 135), Linear Algebra (MAT 22A, 167), Prob. Theory/Math Stats. (STA 131A/B/C), Real Analysis (MAT 25, 125A/B/C, 201A), Measure Theory (MAT 206), STA 141A
  - Math courses are important!!! If I knew I wanted to pursue a PhD earlier, I would've majored in math.
  - Stats PhD courses are basically math courses.

Personal Journey (Why UMich?)

- Was choosing between UMich and Cornell
- Chose UMich because
  1. Large department consisting of faculty with diverse research interests
     a. Didn't know what my research interests were so this was important to me
  2. The collaborative and laid-back environment
  3. Endless opportunities for diverse interdisciplinary collaboration
     a. UM has a department for essentially every scientific field and most of them are ranked top 10.

Personal Journey (PhD coursework, Research, TA)

- **What I like**
  - Classmates came from diverse backgrounds with different strengths and weaknesses
    - People who were strong in math helped others in theory courses
    - People who have industry experience shared their experiences when completing projects
  - Collaborative non-competitive environment among students
  - Faculty with diverse research interests
  - My advisor (Yang Chen) is super supportive and helpful!!
  - Some students view TA'ing as a burden. I find it to be really fun.
    - Sense of accomplishment when research is progressing slowly.
    - Learning opportunity. Sometimes I feel like I am learning more than my students.
  - After finishing coursework, I have the opportunity to...
    - Pursue research questions that I am interested in.
    - Interact with peers who have the same research interests on a regular basis.
    - Attend weekly seminars given by world-class professors.
    - Sleep at 4am and wake up at noon.

Personal Journey (PhD coursework, Research, TA)

- **What I dislike**
  - PhD coursework is hard....
    - Basically math courses
    - Expected to be more independent which may be a difficult transition from undergrad.
      - Expected to look things up by yourself (e.g. proofs of theorems)
  - Research is hard...
    - Could potentially pursue a research direction for a long time that ends up failing
    - Long time-span of projects (many months, and even years)
    - Etc... (This could get really long)

Advice

1. Take more math/graduate statistics courses (and do well in them)
    a. MAT 125ABC, MAT 201, STA 200ABC, etc
2. Get involved in research
    a. RTG, undergraduate thesis, etc
3. Letters of recommendation are important!
    a. Don't just try to get rec letters from famous professors. Letters from junior faculty can sometimes be more helpful if they have more to say about you.
4. Don't focus too much on GRE (controversial)
    a. Not saying don't prepare for it but don't spend an entire summer just memorizing GRE vocab. It is not as important as you might think.
5. Seek advice from faculty

Questions?

Thanks for coming!