Stanford University

MATHEMATICAL & COMPUTATIONAL SCIENCE
DATA SCIENCE
STATISTICS

Commencement

Sunday, 13 June 2021

Program

Speaker

Brad Klingenberg, PhD '12, Statistics
Chief Algorithms Officer, *Daily Harvest*

Award Recipients

Undergraduate

J. E. Wallace Sterling Award for Scholastic Achievement
Distinction
Phi Beta Kappa

Graduate

Knight-Hennessy Scholar
Stanford Stein Fellow
Centennial Teaching Awards
Dissertation Awards

Graduating Students

Mathematical & Computational Science Program

Master of Science in Statistics - Data Science

Master of Science in Statistics

Doctor of Philosophy in Statistics

~~~
~~~

Speaker

Brad Klingenberg

PhD '12, Statistics
Chief Algorithms Officer, *Daily Harvest*

Hello 2021 MCS and statistics graduates, families and friends. I'm Brad Klingenberg, a 2012 graduate of the statistics dept. It's an honor to get to speak to you and the many luminaries of the faculty today as we mark this important occasion and milestone. First and foremost, congratulations! You have worked hard to get here, and should enjoy the moment of reflection on this great achievement. It's well deserved.

The stark challenges of the last year - sometimes physical, sometimes emotional – makes your accomplishments – built on perseverance and resilience – all the more remarkable. So once again, congratulations!

In contrast with the challenges of the last year are the opportunities ahead of you! There has likely never been a better time to be in your seat. Data science, machine learning and AI continue to transform science and industry.

Today I will offer my own small advice, two lessons, drawn from my own life as a graduate of the statistics dept.

The first lesson is to be open to finding problems in places you might not expect.

This is a lesson that's shaped the course of my professional life. I spent the most important chapter of my career, almost eight years, at an ecommerce company and online personal styling service called Stitch Fix, that used data and algorithms to power the personalization and recommendations that made the company a success.

I can tell you with total sincerity that when I was in your seat I would never have expected to be with you today telling you about my career in fashion!

Speaker

My first experiences in industry followed the well-traveled paths to big tech and finance. And these paths are popular for a reason – they often lead to very interesting and fulfilling careers. But after several years one of my mentors from Netflix reached out to me with some surprising career news – he had left Netflix to join a fashion startup called Stitch Fix.

At first I was surprised by the choice – after all, what could be harder to quantify than something that prides itself on being artistic, subjective and even ephemeral? But I was intrigued. I knew the involvement of my mentor meant that something interesting was happening. So I met the team.

What soon became clear was that despite my initial surprise this was a domain primed for data, statistics and algorithmic decision making. Feedback from clients helped us not only learn their preferences, but enabled using that same data to efficiently manage inventory and even design new clothes. Over the years the team and the scope of problems we solved grew – when I left the company earlier this year we had over 140 data scientists and engineers continuing to innovate solutions for our hardest problems. Finding this application of statistics in an unexpected place led to the most fun and important chapter of my career.

I've since started a new chapter at a company called Daily Harvest – and once again find myself working on problems that I would never have anticipated, even a few short years ago. Daily Harvest has a dual mission of removing the frictions between the way we want to eat and the way we actually eat, and creating healthier and more sustainable food systems.

Once again to my surprise the potential for data and statistics are at the heart of this mission. Feedback from customers makes it possible to know them as individuals instead of averages and to truly personalize their experience. And Daily Harvest's innovative logistics create a supply chain that is nimble and primed for data-driven

exploration to efficiently and sustainably create exactly the food customers want.

Much as the rise of the personal computer transformed industries, we are still in the midst of a wave of data science crashing over, and sometimes into, industries. It's trendy to claim to be data driven, but the reality is that in many settings the use of data to make decisions and power systems and products is superficial or missing altogether. That's where you come in.

The lesson to draw is that the toolset of an MCS or statistics graduate – your toolset – is incredibly valuable even in places beyond the largest employers of quantitative professionals, and in places you might not first expect.

And this leads me to the second lesson I'd like to share today – that you shouldn't be afraid of being a generalist.

When I first started working in industry I found the wide scope of tools, technologies and potential areas of expertise very intimidating. I wasn't really an engineer – could I work with Big Data? I'd read some Tufte, but would I really effectively visualize complicated data? How could I ever master everything I would need to know when there was so much to learn, and so much that seemed to change faster than I could ever hope to learn it?

My impulse was to retreat to my training, to seek comfort in the confines of specialization. I had a PhD in statistics – I hoped I could at least be pretty good at that. And staying in your lane makes it easier to not feel like an impostor.

But I soon started to see that my work was more valuable when I embraced the perspective of a generalist, and especially when I prioritized the problem over the solution.

An illustrative example of this was managing inventory at Stitch Fix – a retailer with enormous investments in physical inventory. This

Speaker

wasn't just a statistics problem. Absolutely yes, it involved applied statistical problems of modeling, prediction and inference.

But It was also an optimization problem, a control system problem, a risk management problem, an organizational design problem. By focusing on the business problem, not just the math problem, we were able to draw on the cumulative experience of many disparate disciplines to assemble an efficient assortment of inventory that delighted clients by drawing on our knowledge of both their individual and collective preferences.

But this requires a comfort with lacking expertise, and comfort continuing to learn beyond your formal training. You don't have to know everything – and you certainly won't – but you have the tools to learn. And recognizing that you will always need to keep learning isn't a weakness – it's a strength.

This idea of strength through growth is at the heart of Stanford Psychologist Carol Dweck's distinction between a fixed and growth mindset. In her words, a "growth mindset is based on the belief that your basic qualities are things you can cultivate through your efforts", whereas a fixed mindset views opportunities as limited by your current self. A growth mindset is critical to thinking of problems before solutions.

One of my favorite definitions of the often-ambiguous term "data science" is a quip from Josh Wills that, "a data scientist is a person who is better at statistics than any software engineer and better at software engineering than any statistician". Embracing this interdisciplinary approach is not only fascinating – it also works really well – especially when working on new problems or domains.

If you combine these two lessons, that there are rich and interesting problems in places you might not expect, and that you shouldn't be

Speaker

afraid of approaching problems as a generalist, you will start to see opportunity all around you.

In my own career I've found that the largest impact from myself and my teams has come not from getting that extra epsilon of predictive performance in a supervised learning setting, but from rethinking basic problems: like how should a retailer decide what clothes to buy?

Much of the world, including the business world, operates with a great deal of inertia and inherited wisdom. One of the positive sides of the Silicon Valley disruption ethos is a recognition that we can sometimes do much better by taking a new approach. And in most cases, that new approach is better if it involves a thoughtful quantitative framing and the rigors of scientific thinking.

One of the best pieces of advice I've heard is actually a well-known quote from Steve Jobs – "Everything around you that you call life was made up by people that were no smarter than you and you can change it, you can influence it, you can build your own things that other people can use. Once you learn that, you'll never be the same again."

It's a powerful mindset. To be sure, you should always respect the expertise of others, and try to stand on the tallest shoulders you can find. But be curious. Be skeptical, and don't be afraid to keep learning.

Congratulations Class of 2021! Thank you for having me – you have my most heartfelt wishes for your bright futures!

~~~
~~~

Award Recipients

MATHEMATICAL AND COMPUTATIONAL SCIENCE

J. E. WALLACE STERLING AWARD FOR SCHOLASTIC ACHIEVEMENT

Julia Gong
Megumi Sano

DISTINCTION

Gabrielle Candès
Matthew Colón
Kaan Ertaş
Isabella Fulford
Jared Geller
Julia Gong
Sabrina Lu
Megumi Sano
Yutong "Coco" Sun
Yanqiu Wang
Tatiana Wu
Justin Xu

PHI BETA KAPPA

Gabrielle Candès
Matthew Colón
Kaan Ertaş
Isabella Fulford
Jared Geller
Julia Gong
Sabrina Lu
Megumi Sano
Justin Xu

~~~
~~~

Award Recipients

STATISTICS

KNIGHT-HENNESSY SCHOLAR
Tsion Agajie Tesfaye

STANFORD STEIN FELLOW
Michael Sklar

CENTENNIAL TEACHING AWARD
Shuangning Li
Michael Sklar

INGRAM OLKIN
INTERDISCIPLINARY RESEARCH DISSERTATION AWARD
Nima Hamidi
for an elegant and general analysis framework of online decision-making algorithms that led to new understanding of the Thompson Sampling algorithm and novel approaches for data-driven exploration.

JEROME H. FRIEDMAN
APPLIED STATISTICS DISSERTATION AWARD
Zhimei Ren
for improving the replicability of scientific findings and the assessment of their uncertainty in sensitive applications.

JEROME H. FRIEDMAN
APPLIED STATISTICS DISSERTATION AWARD
Jingyi Kenneth Tay
for the development of novel tools that will have significant impact in applied statistics and data science, and their implementation through robust software.

~~~
~~~

Award Recipients

STATISTICS (continued)

PROBABILITY DISSERTATION AWARD

Youngtak Sohn

for important contributions to the study of phase transitions in disordered systems and its applications to random constraint satisfaction and high-dimensional estimation.

THEODORE W. ANDERSON THEORY OF STATISTICS DISSERTATION AWARD

Michael Celentano

for new, sharp analysis of high-dimensional regression, leading to new methodology for statistical inference.

~~~
~~~

Conferral of Degrees

MATHEMATICAL AND COMPUTATIONAL SCIENCE

Bachelor of Science with Honors

Ahmed Mohamed Ahmed
Jackson Graham Eilers
Isabella Catherine Teresa Fulford
Raymond Gilmartin
Francesco Maria Gabriele Insulla
Megumi Sano

~~~

Bachelor of Science

Macalister Michael Bagwell
Laura Pearl Bryant
Gabrielle Sylvie Candès
Lilia V Chang
Liam Christensen
Zolboo Chuluunbaatar
Rebecca Cohen
Matthew Jared Colón
Richard Gresham Correro
Kyle Vikram D'Souza
Keith Berry Eicher
Kaan Ertaş
Jared Matthew Geller
Julia Gong
Filip Dupont Grantcharov
Anshul Prakash Gupta
Sahil Gupta
Louie D Kam
Matthew David Kissinger Kaplan
Sophia Grace Kazmierowicz

~~~

Conferral of Degrees

MATHEMATICAL AND COMPUTATIONAL SCIENCE

Bachelor of Science (continued)

Kissel Kendall
Sabrina Rong Lu
Erika Paige Malaspina
Veer Siraj Shah
Yutong Sun
Daniel Tan Chee Hian
Yanqiu Wang
Tatiana Xiaobing Wu
Justin Xu
Christine Yang

~~~

DATA SCIENCE

Master of Science

Dominik Damjakob
Amelia Gilson
Xiaotong Gui
Yuan Liu
Ishan Shah
Tsion Agajie Tesfaye
Cheuk To Tsui
Justin Wong
Samuel Wai-Yan Wong

~~~

Conferral of Degrees

STATISTICS

Master of Science

Rocky Aikens
AJ Alvero
Paul Boehringer
Jose Bolorinos
Spencer Braun
Alexandre Bucquet
Anastasia Butskova
Shuvam Chakraborty
Amy Chou
Jack Collison
Avery Delmaine
Toren Fronsdal
Andrew Kirjner
Yu Jin Lee
Fangchen Li
Zelin Li
Sagar Maheshwari
Brian MacDonald Powell
Douglas Russo
Robert Schmidt
Zhu Shen
Nian Si
Trisha Singh
Xulu Sun
Yijie Sun
JakeTaylor
Eray Turkel
Peter Wang
Yuyan Wang
Lingjue Xie

~~~
~~~

Conferral of Degrees

STATISTICS

Master of Science (continued)

Angela Xu
Justin Xu
Yichen Yang
Jeremy Mi Yu
Ruohan Zhan
Boning Zheng
Jiying Zou

~~~

Doctor of Philosophy

Michael Celentano
Topics in Exact Asymptotics for High-dimensional Regression
Dissertation Advisor: Professor Andrea Montanari

Nima Hamidi
Minimax Regret Bounds for Stochastic Linear Bandit Algorithms
Dissertation Advisor: Professor Mohsen Bayati

Zhimei Ren
Model-Free Methods for Multiple Testing and Predictive Inference
Dissertation Advisor: Professor Emmanuel J. Candès

Michael Sklar
Adaptive Experiments and a Rigorous Framework for Type I Error Verification and Computational Experiment Design
Dissertation Advisor: Professor Tze Leung Lai

Jingyi Kenneth Tay
Extending the Reach of the Lasso and Elastic Net Penalties: Methodology and Practice
Dissertation Advisor: Professor Robert Tibshirani

~~~