

BECOMING A DATA SCIENTIST

Michael Rappa

Goodnight Director and Distinguished University Professor
Institute for Advanced Analytics
North Carolina State University

From today's headlines...

glassdoor Jobs Company Reviews Salaries Interviews Salary Calculators

Job Title, Keywords, or Company

50 Best Jobs in

Best Jobs

2019

United States

Job Title

Median Base Salary

#1 Data Scientist

\$108,000

#2 Nursing Manager

\$83,000

#3 Marketing Manager

\$82,000

9:07 AM Sun Sep 15

pcmag.com



REVIEWS BEST PICKS HOW-TO NEWS SMART HOME BUSINESS SHOP

#iPhone11 #BestNFLStreaming #AppleWatchSeries5 #EAProjectAtlas #Android10

Looking to Switch Careers? Data Science is Booming

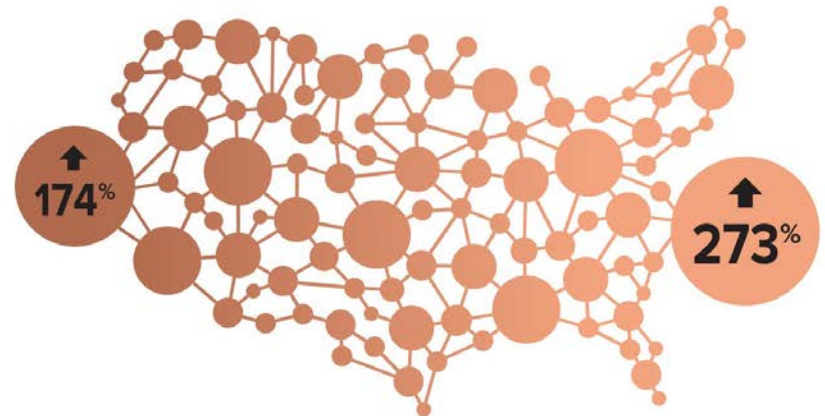
The field is growing rapidly, and not just in Silicon Valley. The number of data science jobs on the East Coast increased 273 percent in 2019, compared to 174 percent on the West Coast.



By Angela Moscaritolo September 10, 2019 5:00AM EST

f t in p r e 32 SHARES

% increase of Data Science jobs on the West Coast and East Coast of America
(January to June 2018 vs January to June 2019)



harnham



[Track my jobs](#)

[Career interests](#)

[LinkedIn Salary](#)

[Looking for talent?](#)

[Post a job](#)

Your dream job's just a search away...

[Search](#)



data scientist

United States

Search



Jobs

Sort by

Date Posted

LinkedIn Features

Company

Experience Level

All filters

Data scientist in United States

27,468 results

Job Alert Off



Data Scientist, Senior

Promoted

Booz Allen Hamilton

Hawaii, HI, US



36 alumni work here

3 weeks ago



Senior Data Scientist

Promoted

Amazon

Seattle, WA, US



Be an early applicant

3 weeks ago



Customer Insights, Data Scientist

Promoted

TIAA



Customer Insights, Data Scientist



TIAA · Charlotte, NC, US

Posted 2 weeks ago · 344 views

Save

Apply

Job

- 72 applicants
- Entry level

Company

- 10,001 employees
- New York, NY

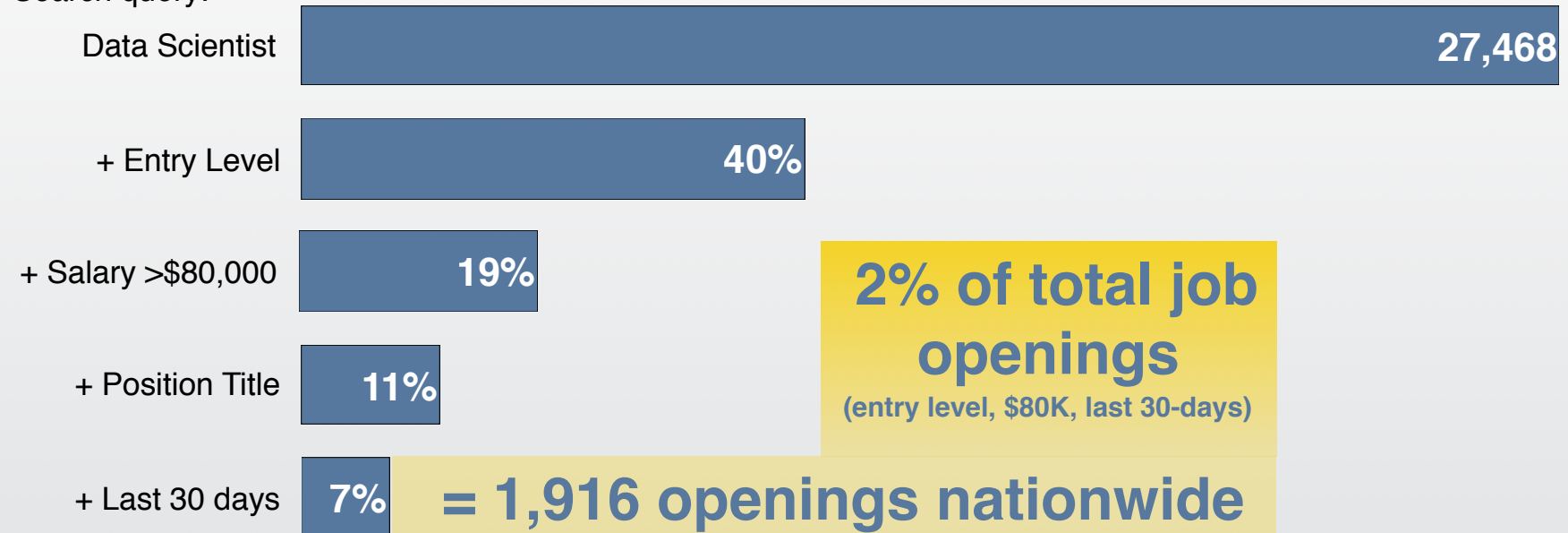
Connections

- 4 connections
- 8 alumni

27,468 job openings

U.S. Job Openings for Data Scientists by Search Specificity

Search query:



Source: LinkedIn Job Openings, September 15, 2019

<https://go.ncsu.edu/data-jobs>

U.S. Employment Market for “Data Scientists”

Weekly average for the month of September, 2019



↓ 29%



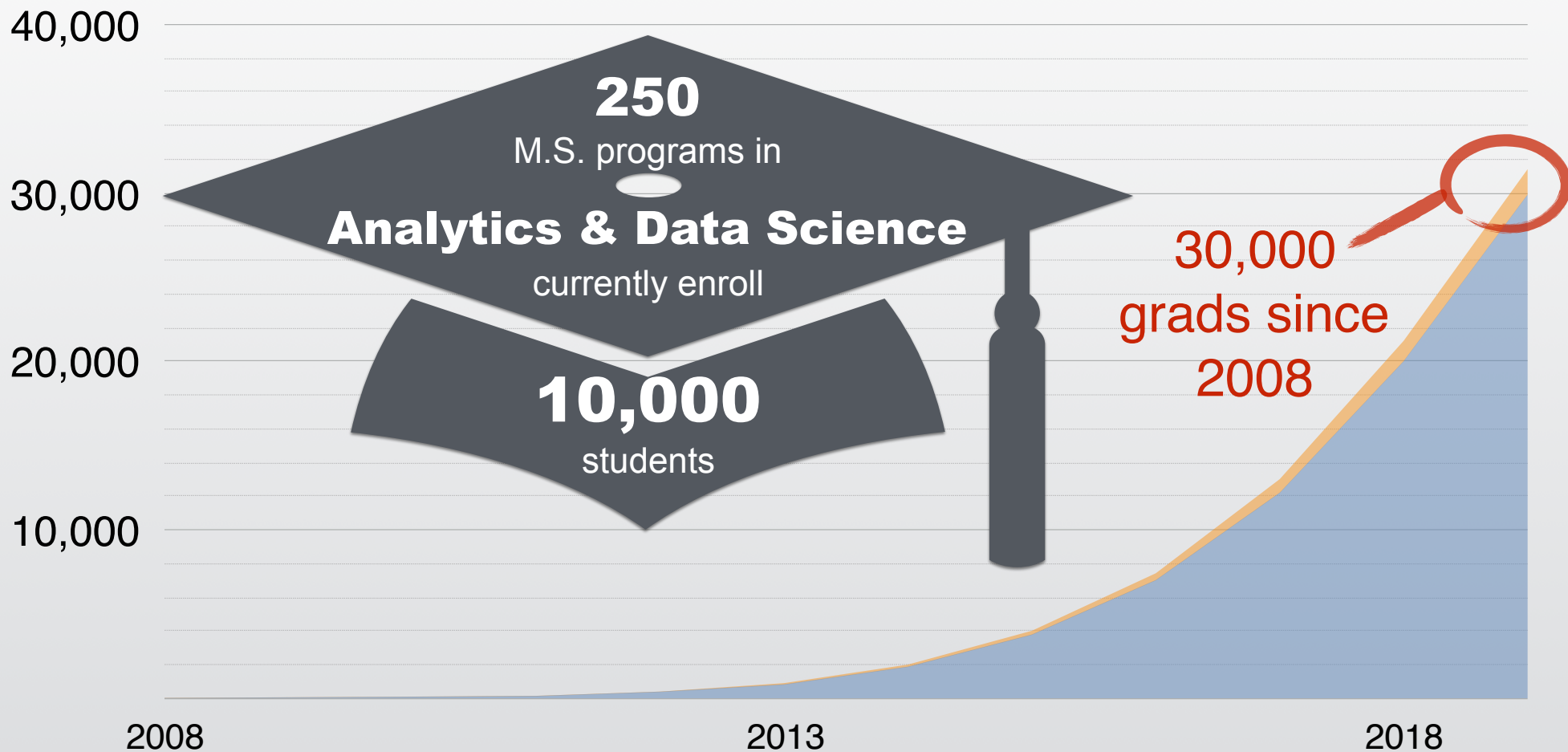
↑ 16%



↓ 4.0 pp

<https://go.ncsu.edu/data-jobs>

Cumulative Number of Analytics and Data Science Master's Degrees Awarded in the United States



Cumulative Number of Analytics and Data Science Master's Degrees Awarded in the United States

40,000

30,000

20,000

10,000

2008

2013

2018

Data Scientist, Capital

Square · San Francisco, CA, US

Posted 1 day ago · 3,757 views

[Save](#) [Apply](#)

868 applicants in 1 day!

Job	Company	Connections
<ul style="list-style-type: none">• 868 applicants• Entry level	<ul style="list-style-type: none">• 1,001-5,000 employees• Internet	<ul style="list-style-type: none">• 1 connection• 8 alumni

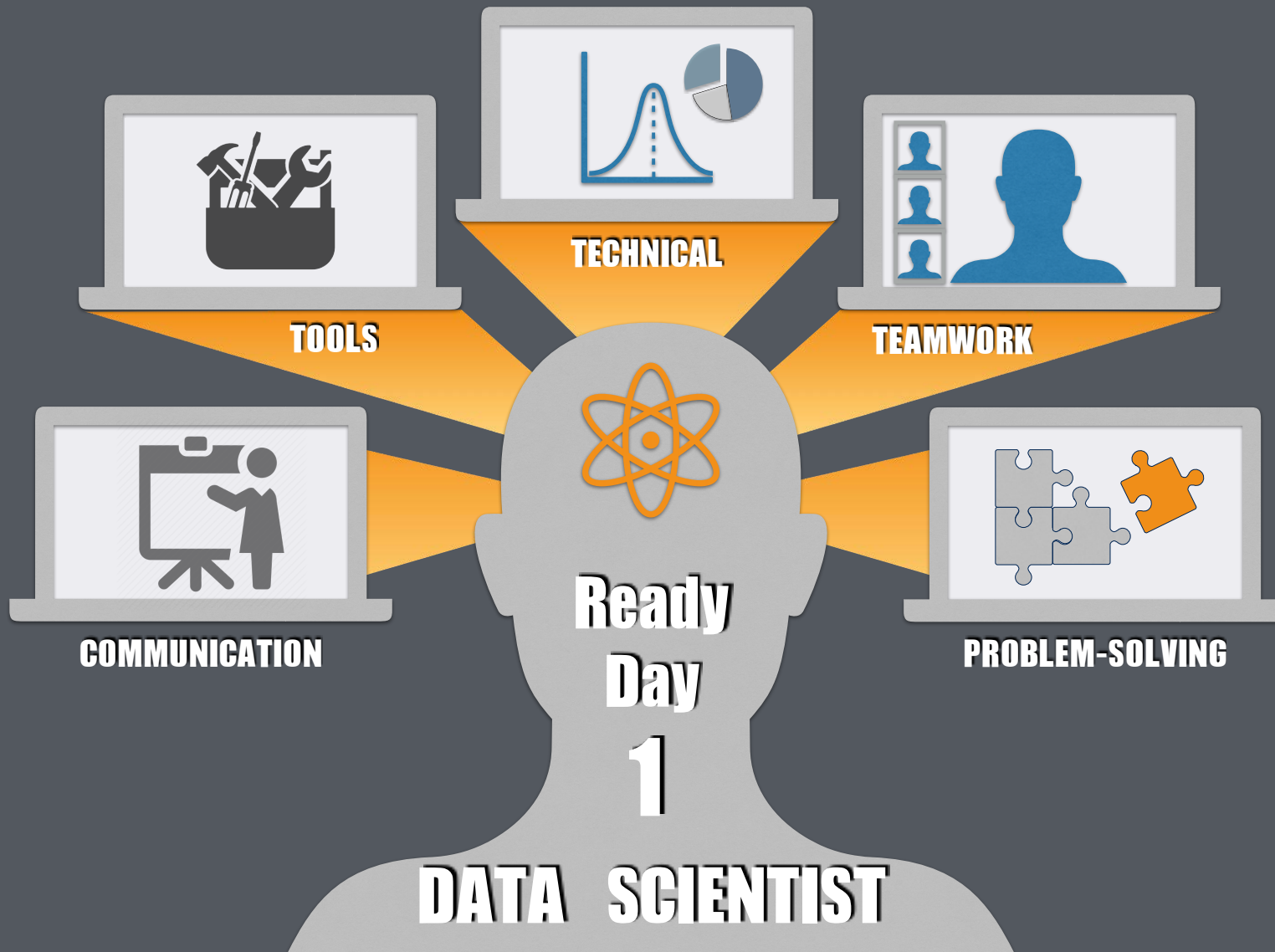
>

>

> become the data

> scientist employers want

> most to hire..._

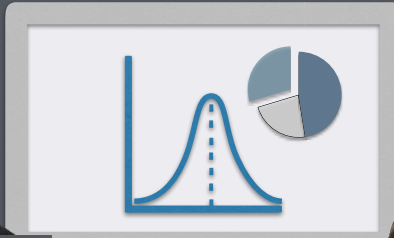




Garrett '19
Mathematics, UNC'15
Data Scientist, DISH



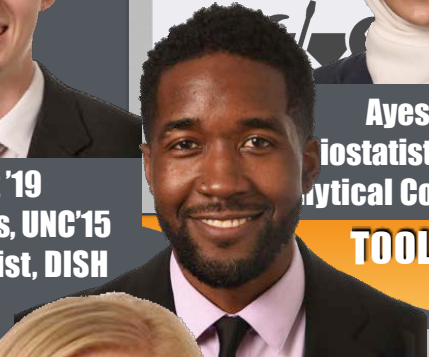
Ayesha '18
Biostatistics UNC'17
Statistical Consultant, SAS



Eliza '18
Public Policy UNC'15
Data Scientist, IBM



Kevin '16
Business UNC'15
Data Scientist, Home Depot



Cory '19
Statistics, UNC'01
Data Scientist, Fifth Third

TOOLS

TECHNICAL

TEAMWORK



Nikhil
Stat/Comp Sci
Data Scientist



Erin '15
Mathematics, UNC'14
Sr Consultant, Deloitte

COMMUNICATION



Ben '19
Stat/Econ UNC'18
Data Scientist, Bain



Charlotte '19
Stat/Environ Sci, UNC'18
Primrose Schools

> Paths to Becoming a Data Scientist



Ph.D.

Traditional M.S.

Analytics/DS M.S.

Certificates

Bootcamps

Self-study (DYI)

	Technical	Tools	Teamwork	Commun.	P-Solving
Ph.D.					
Traditional M.S.					
Analytics/DS M.S.					
Certificates					
Bootcamps					
Self-study (DYI)					

>

>

>

> the MSA algorithm..._

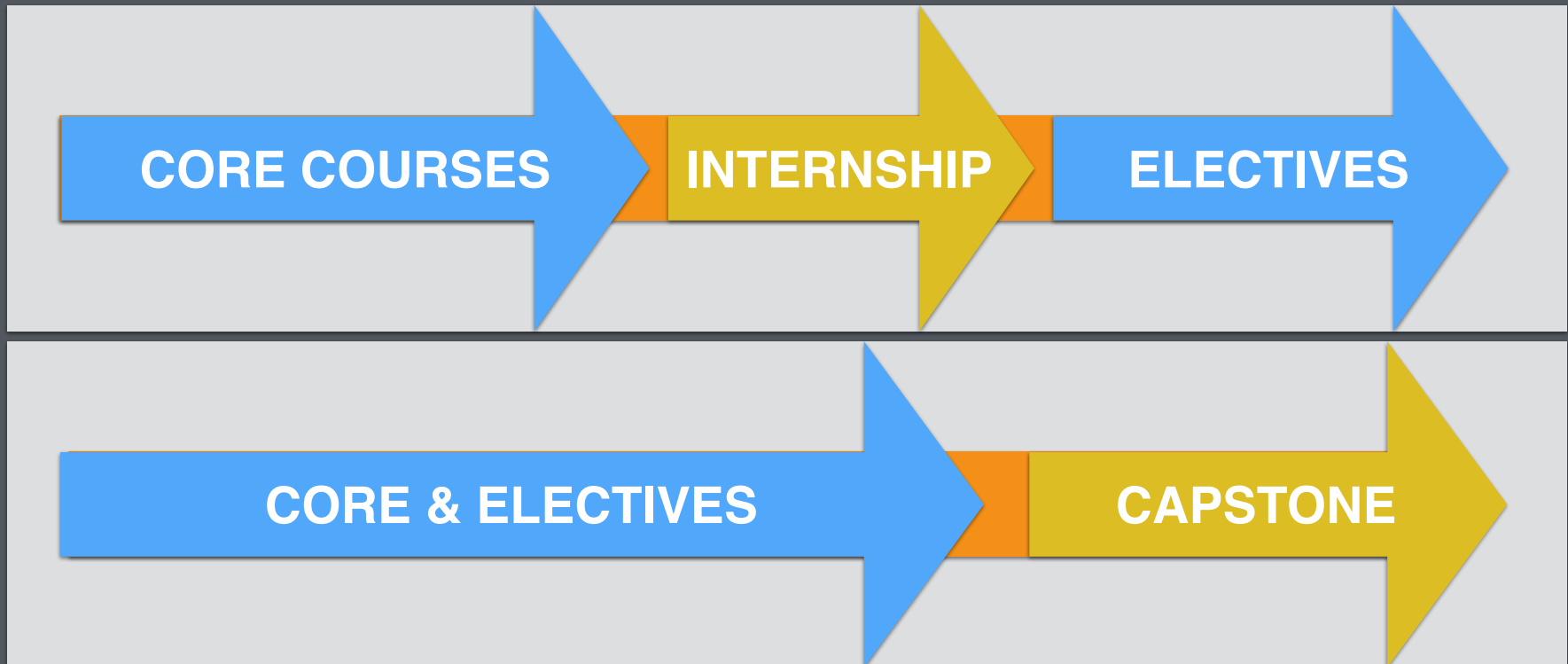


6,720 hrs



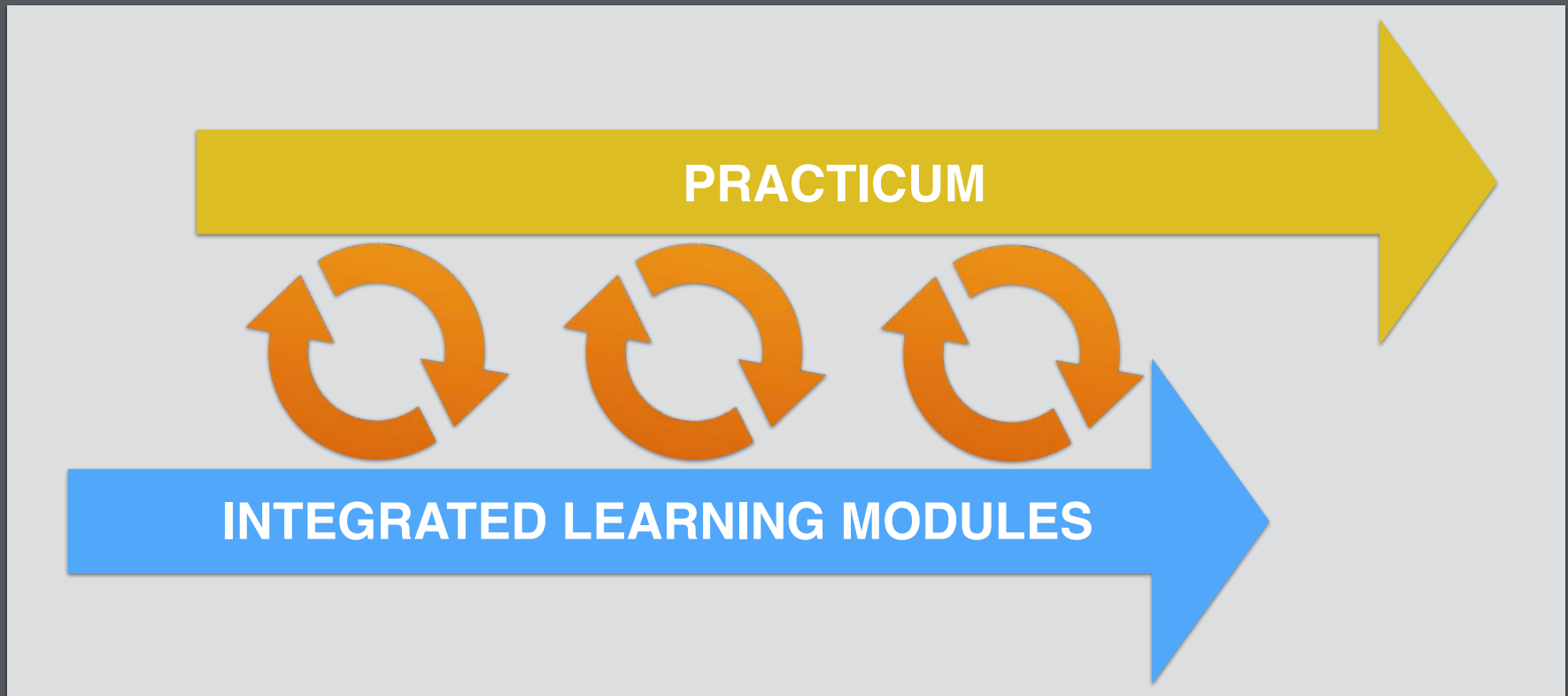
-
- **APPLY SKILLS**
 - **CONTRIBUTE**
 - **LEARN MORE**
 - **EARN FAIR WAGE**

Traditional Learning Models





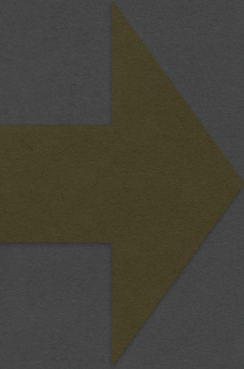
Institute Learning Model





Fraud Detection
Deep Learning
Optimization
Simulation
Survival Analysis
Big Data
Machine Learning
Text Mining
Data Mining
Visualization
Time Series
Linear Algebra
Logistic Regression
Python
R, SAS, SQL

INT





Bank of America Practicum
Team (L-R): Liz Mao, John
Coletta, team leader Ben
Yip, David Hiltbrand, and
Laney Sears

E/evate



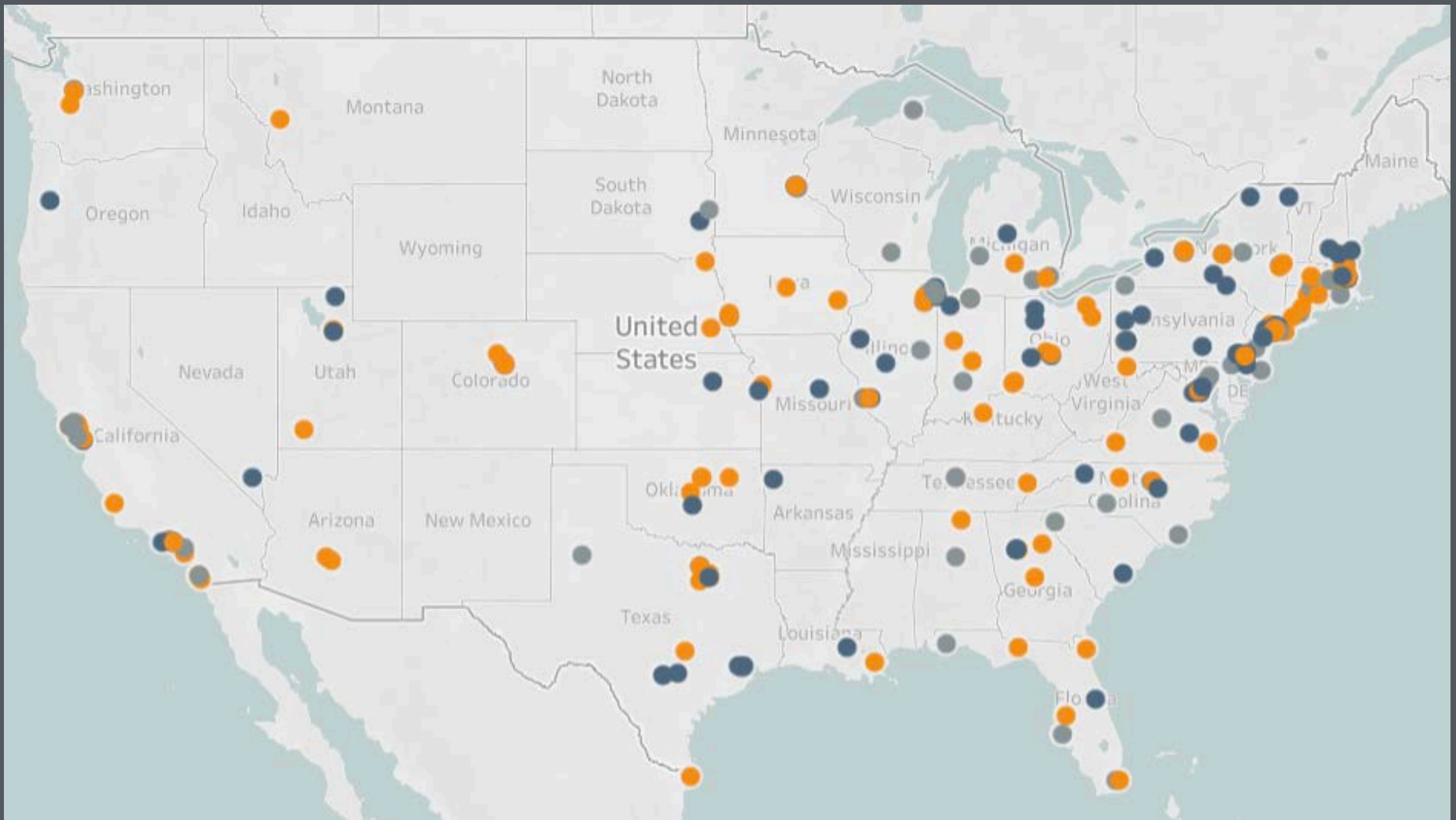
RYERSON



>

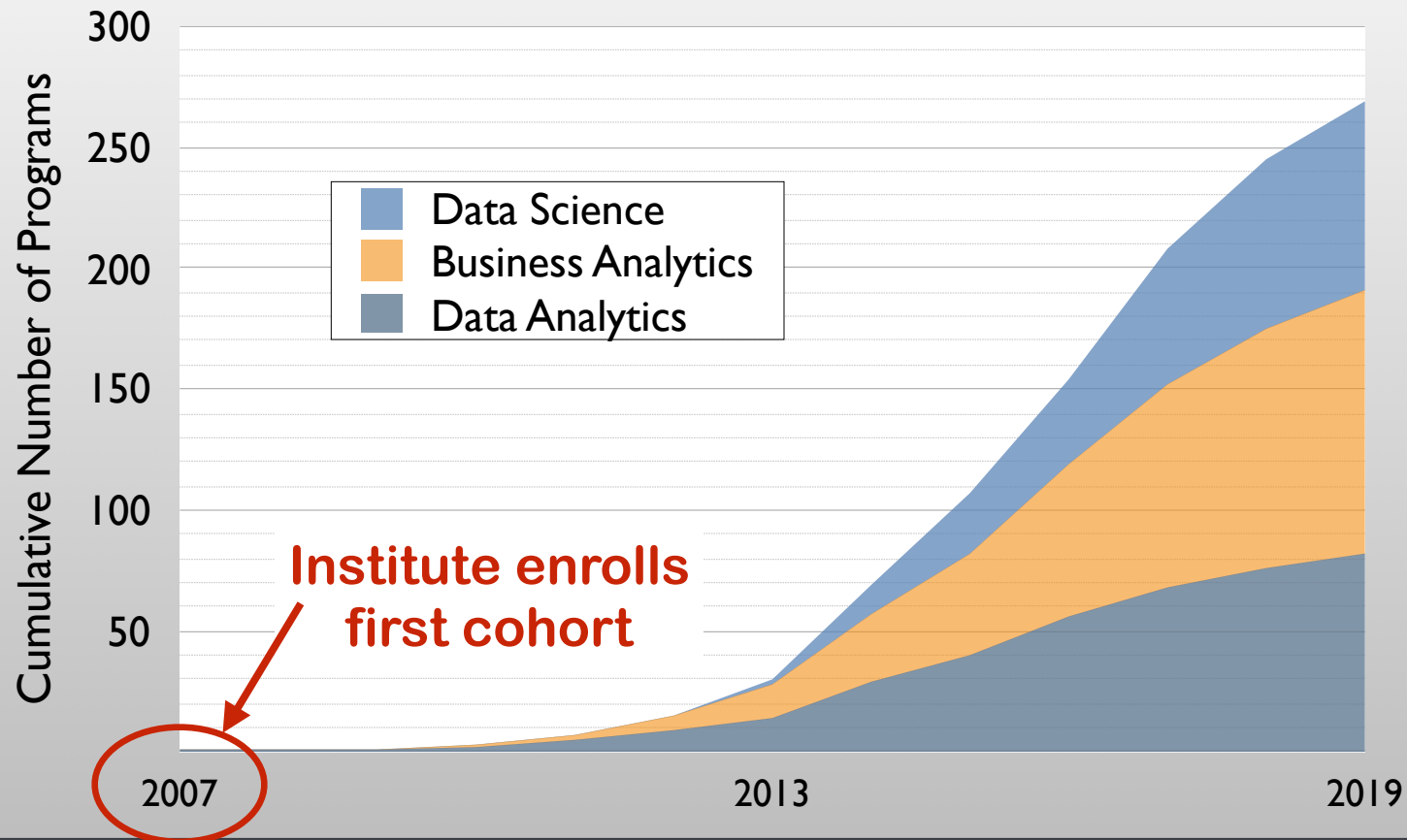
>

> How to choose the path
> that's right for you?_



<https://go.ncsu.edu/data-degrees>

The Growth of Analytics and Data Science Master's Degree Programs in the United States



<https://go.ncsu.edu/data-degrees>

> 3 key questions...

>

>

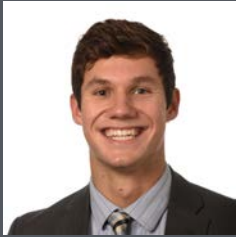
> Will your fellow students be as

> talented and motivated as you are?



Practicum team (L-R):
team leader Emily,
Jagadeesh, Roger,
Conor, and Katrina.

- > UNC grads enrolled: 131 (15%)
- > average age: 25 (range: 20-40)
- > women: 45%
- > gpa: 3.47
- > distribution of majors:
 - > -- math/statistics: 31%
 - > -- business/economics: 33%
 - > -- science/engineering: 18%
 - > -- other majors: 18%



Jackson Cabell

B.S., with Highest Distinction,
Statistics and Analytics; Economics
UNC–Chapel Hill, 2019



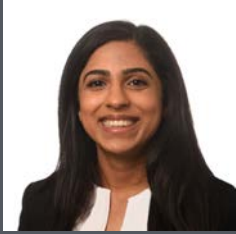
Walter Creech

B.S., with Distinction,
Statistics and Analytics; Economics
UNC–Chapel Hill, 2019



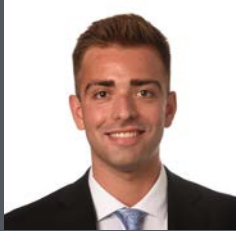
Maxwell Fairbairn

B.S., with Distinction,
Statistics and Analytics
UNC–Chapel Hill, 2019



Mehak Shamdasani

B.A., Computer Science
UNC–Chapel Hill, 2018



Noah Sayre

B.S., with Highest Distinction,
Computer Science
UNC–Chapel Hill, 2019

2020

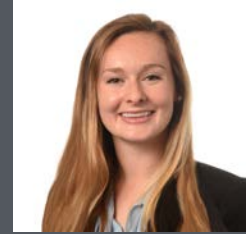
Kyle Clapper

B.S.B.A., with Distinction,
Business Administration
UNC–Chapel Hill, 2019



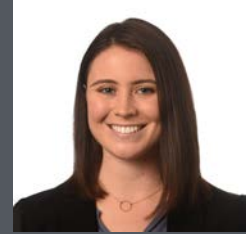
Ellen Davis

B.S.P.H., with Highest Distinction,
Biostatistics
UNC–Chapel Hill, 2019



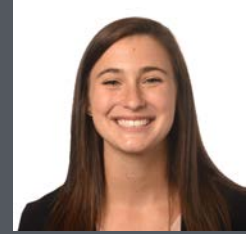
Elaine King

B.S., with Distinction,
Biostatistics; Women’s and Gender Studies
UNC–Chapel Hill, 2018



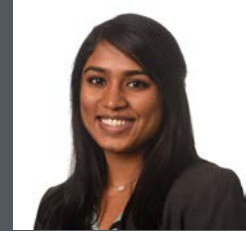
Sarah Wotus

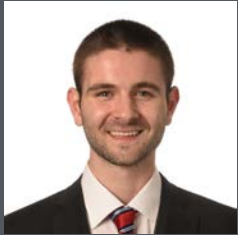
B.S., with Highest Distinction,
Biostatistics
UNC–Chapel Hill, 2019



Ragi Nayak

B.S.P.H., Biostatistics
UNC–Chapel Hill, 2019





Grant King

B.A., with Highest Distinction,
Economics; Linguistics
UNC–Chapel Hill, 2017



Benjamin Roberts

B.A., with Highest Distinction,
Economics; Political Science
UNC–Chapel Hill, 2018



Khoi Tran

B.A., with Distinction,
Economics
UNC–Chapel Hill, 2015



McKinnon Martin

B.A., Economics
UNC–Chapel Hill, 2017



Ryan Weisner

B.A., with Distinction,
Economics; Public Policy
UNC–Chapel Hill, 2018

2020

Basil Rodts

B.S., with Distinction,
Statistics and Analytics; Environmental Science
UNC–Chapel Hill, 2019



Andrea Kopaskie

B.S., Environmental Sciences
UNC–Chapel Hill, 2017



Payal Patel

B.S., with Distinction,
Information Science
UNC–Chapel Hill, 2017



Sameen Salam

B.S., Biology; Music
UNC–Chapel Hill, 2019



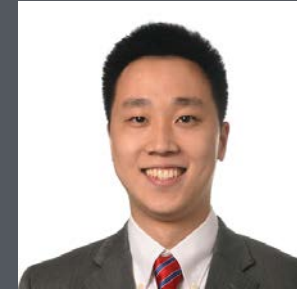
Sandy Preiss

B.A., with Distinction, Psychology
UNC–Chapel Hill, 2009



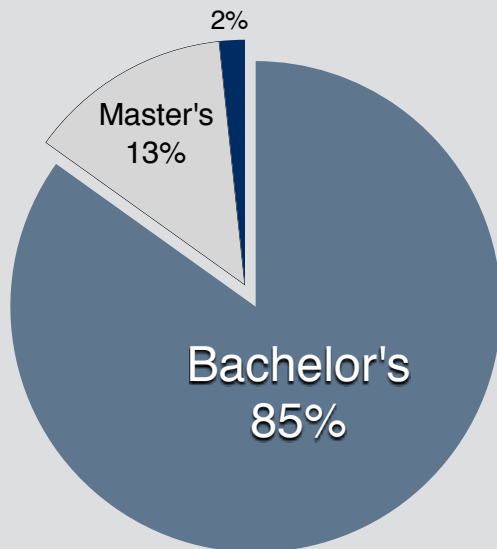


Lu Wu
Ph.D., Mass Communication
UNC-Chapel Hill, 2017

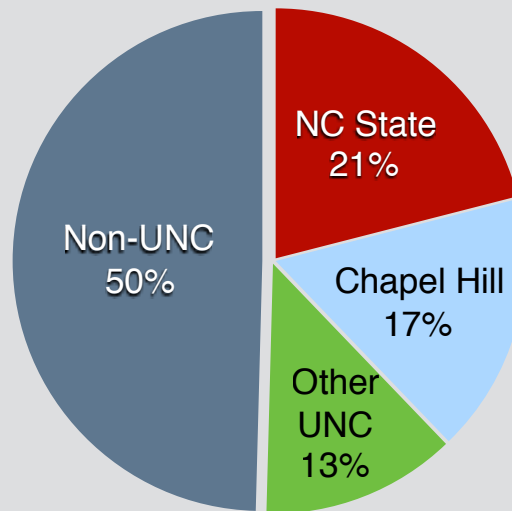


Heqing Sun
M.S., Chemistry
UNC-Chapel Hill, 2018

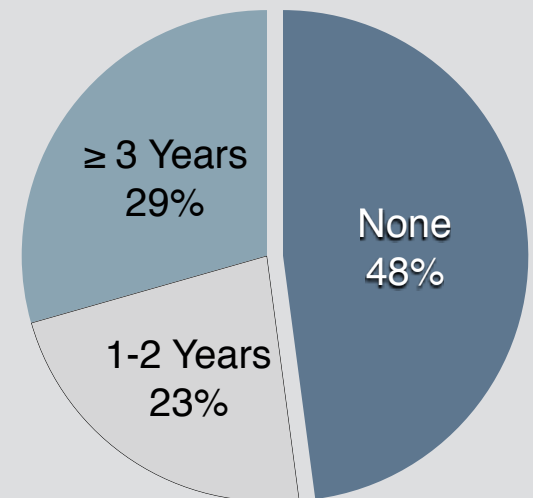
**Class of 2020
Highest Degree Earned**



**Class of 2020
UNC System Graduates**



**Class of 2020
Prior Work Experience**



> Question #2

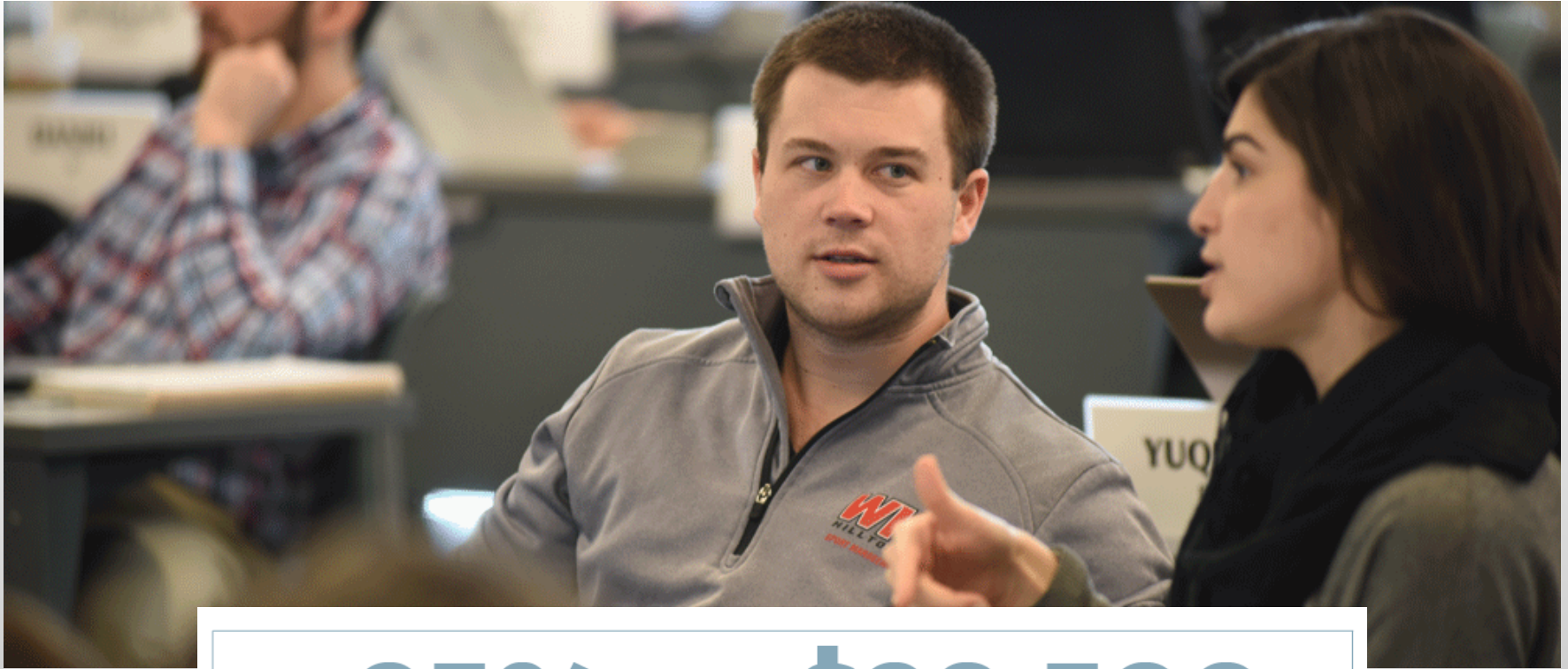
>

>

> What's the anticipated return on

> the time and money you invested?_

- > employment outcomes 131 UNC grads...
- > avg # of job interviews: 13
- > avg # of job offers: 3
- > students placed by graduation: 98%
- > avg starting salary: \$94,100
- > avg signing bonus: \$10,000
- > employers: 64
- > employed in NC: 48%



95%

Employed at Graduation
Class of 2019

\$98,500

Average Base Salary
Class of 2019

5-year average (2015-2019): 96% employed at graduation and \$96,200 average base salary



Dr. Michael Rappa, Founding Director

MASTER OF SCIENCE IN ANALYTICS

2019 EMPLOYMENT REPORT

Number of graduates:	111
Number of graduates seeking new employment:	110
Candidates employed at graduation:	95%
Average base salary:	\$98,500
Number of employers interviewing (number on site):	146 (54)
Median number of initial job interviews per candidate:	12
Median number of offers of employment per candidate:	2
Job placements facilitated by the Institute:	94%
Estimated ROI payback period in months:	23
Total number of reported job offers:	262
Job placements based in North Carolina:	48%
Job placements based in U.S.:	100%
Candidates reporting salary data:	100%

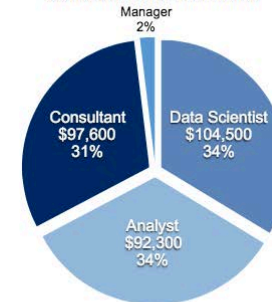
Placement results for Class of 2019 reported as of May 15, 2019.

For further information about recruiting contact: analytics@ncsu.edu

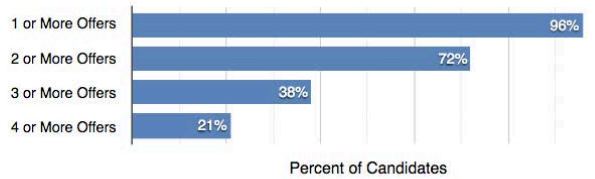
POSITIONS FILLED

- Analytical Consultant (3)
- Advanced Analytics Specialist (4)
- Analytics Analyst (2)
- Analytics Associate
- Analytics Consultant
- Analytics Senior Analyst (2)
- Assistant VP, Senior Decision Scientist (3)
- Assistant VP, AML Data Scientist Associate
- Associate Consultant (2)
- Associate Data Scientist
- Audit Analytics Specialist
- Business Analytics Advisor (2)
- Business Manager
- Business Strategy Analyst (2)
- Clinical Data Programmer Consultant
- Data Analyst (2)
- Data and Analytics Analyst
- Data Scientist (28)
- Director of Computer Vision
- Director of Digital Architecture
- Experienced Associate
- Genetic Project Lead
- Internal Auditor - BSA/AML
- Lead Analyst, BI and Analytics
- Loan Analyst
- Marketing Analytics Lead
- Marketing Analytics Specialist
- Model Validation Analyst
- Quantitative Model Developer (2)
- Risk Analysis Specialist
- Risk Analyst (4)
- Senior Analyst, Asset Protection
- Senior Analyst, BI and Analytics (2)
- Senior Analyst, Customer Analytics
- Senior Analyst, Merchandising
- Senior Associate (2)
- Senior Associate Analytical Consultant (4)
- Senior Associate Test Engineer
- Senior Associate, Business Insights & Analytics
- Senior Business Analyst, Data Process Engineering
- Senior Consultant (8)
- Senior Credit Risk Analyst
- Senior Manager, Card Association Management
- Senior Quantitative Analyst
- Staff Consultant II (6)

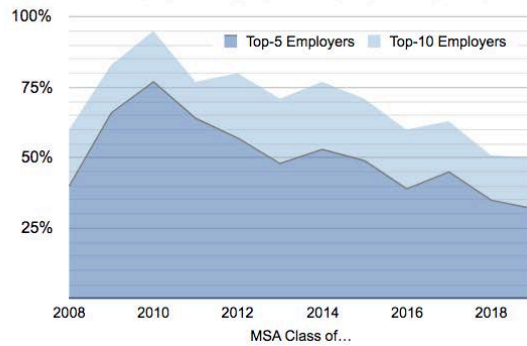
MAJOR TYPES OF POSITIONS AND AVERAGE BASE SALARIES



NUMBER OF JOB OFFERS RECEIVED BY GRADUATION



HISTORICAL TREND IN PLACEMENT CONCENTRATION AMONG THE TOP-5 AND TOP-10 EMPLOYERS



EMPLOYMENT BY RESIDENCY STATUS PRIOR TO ADMISSION

	Number of Candidates Employed		Subtotal
	Inside North Carolina	Outside North Carolina	
Non-Resident	10	19	29
NC Resident	40	35	75
Subtotal	50	54	104

RECRUITING TIMETABLE – MSA CLASS OF 2020

New cohort of 120 students arrives:	June
Basic demographic profile of new cohort published:	July 1
New student roster available on Institute web site:	July 15
Employer information sessions hosted beginning first week of:	September
Student Profile Book available on web site:	October 1
Student Resume Book sent to employers:	December 1
On-site interviews begin second week of:	January
Student placement decision date:	March 15
Graduation date normally in the first week of:	May
Employment Report published:	May 15
Candidates typically begin employment by the first week of:	June
Open job positions can be circulated to MSA alumni:	Upon receipt
MSA recruitment is managed entirely by the Institute as a service provided free of charge as a courtesy to employers.	

DISCLAIMER

The Institute has a proven track record for placing graduates in the analytics profession, but it does not under any circumstance offer a guarantee of employment upon degree completion.

DIRECTOR'S CERTIFICATION

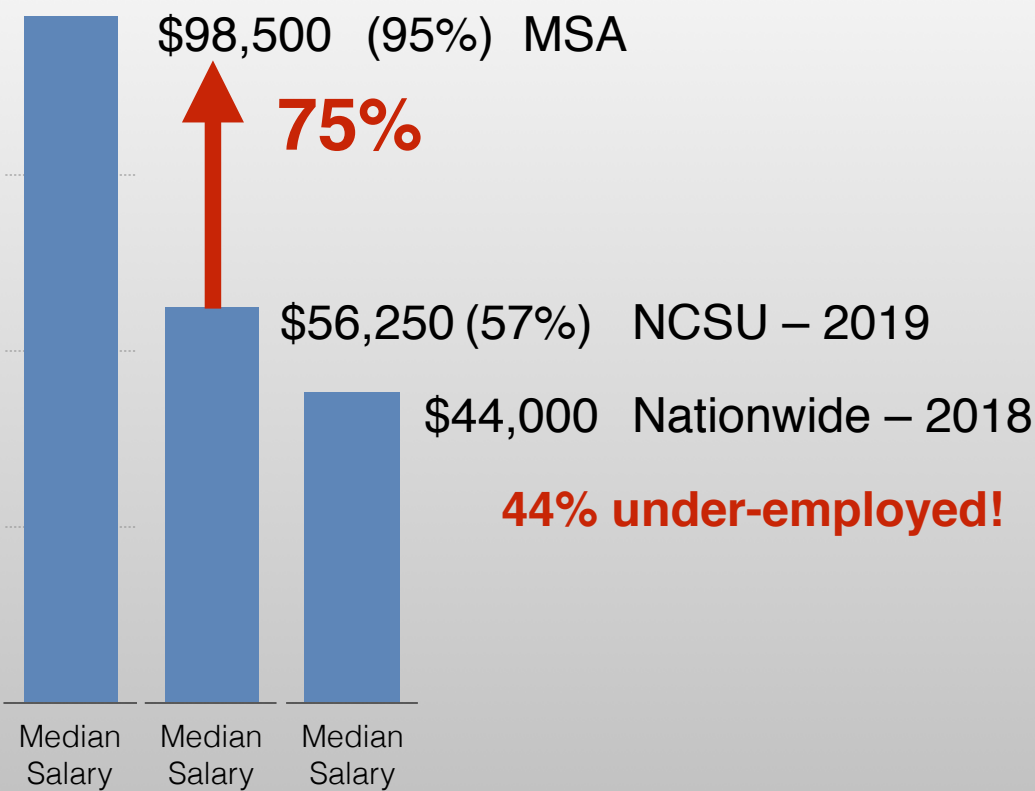
This report of employment outcomes referred to above present fairly, in all material respects, the employment of the Institute's students at graduation as of May 15, 2019 in conformity with principles generally accepted among universities in the United States of America.

Dr. Michael Rappa
Institute Director

Source URL: <http://analytics.ncsu.edu/reports/employment/MSA2019.pdf>

NC STATE UNIVERSITY

Median Starting Salary – Bachelors Degree



Source: NCSU OIRP; U.S. Census Bureau, American Community Survey (IPUMS).

Student Return on Investment (ROI) – Class of 2019

	NC Resident
Pre-MSA Salary Median*	\$63,000
(+) Tuition & Fees	\$26,500
(-) Signing Bonus	\$10,000
Total Investment	\$79,500
Post MSA Salary Median	\$104,000
(-) Pre-MSA Salary	\$63,000
Net Salary Increase	\$41,000
Payback Period (months)	23
*Based on graduates with full-time employment prior to program entry.	

$$\text{Payback period (months)} = \frac{(\text{Pre-MSA Salary} + \text{Tuition}) - \text{Signing Bonus}}{(\text{Post-MSA Salary} - \text{Pre-MSA Salary})} \times 12$$

> Question #3

>

>

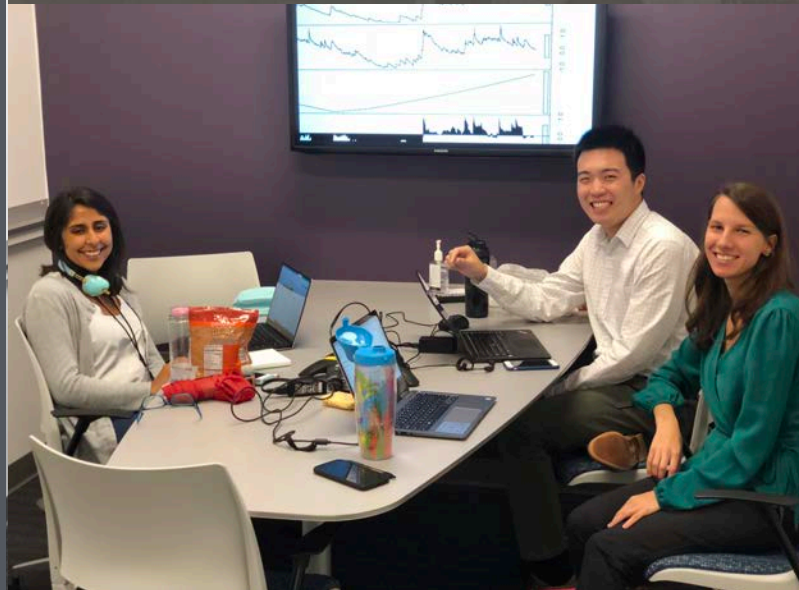
> Where do your tuition dollars go?_



Faculty/staff resources fully dedicated to the program...




Physical resources dedicated to the program...





  <https://analytics.ncsu.edu>



**Institute for
ADVANCED ANALYTICS**

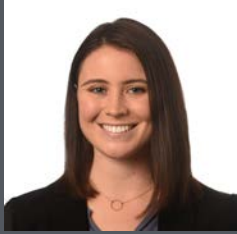
LATEST NEWS ABOUT EDUCATION RESEARCH PEOPLE CONTACT

ACADEMIC EXPERIENCE

- ABOUT THE DEGREE
- CAREER PLACEMENT
- APPLY FOR ADMISSION
- ACADEMIC EXPERIENCE**
- PREREQUISITES
- COST OF ATTENDANCE
- STUDENT PROFILE
- ALUMNI PROFILE
- STUDENT BLOG

Master of Science in Analytics

- About the MSA degree
- Information for Applicants
- Student Profile
- Employment Report
- Current Student Roster
- Information for Employers
- Practicum Sponsorship
- Tuition and Fees
- Alumni Profile
- Data Column – Student Blog



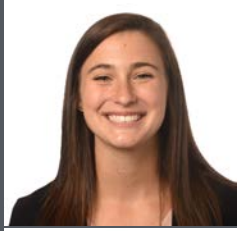
Elaine '18

Biostatistics;
Women's and Gender Studies



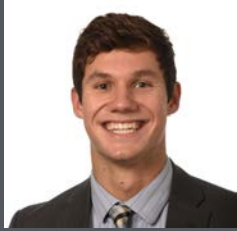
Ragi '19

Biostatistics



Sarah '19

Biostatistics



Jackson '19

Statistics and Analytics;
Economics



**Valerie
Schwartz**

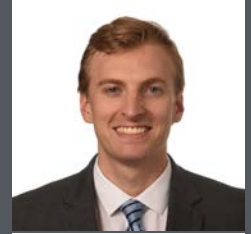
Head of Admissions



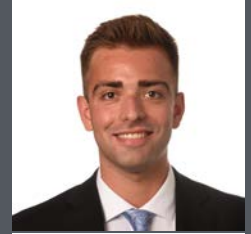
**Da'Esha
McPhaul**

Assistant Head of
Admissions

Maxwell '19
Statistics and Analytics



Noah '19
Computer Science



Payal '17
Information Science



Ryan '18
Economics;
Public Policy



<https://analytics.ncsu.edu>