“CURIOSITY IS THE ENGINE OF ACHIEVEMENT”

- SIR KEN ROBINSON
It continues to be an exciting time in the field of analytics and data science, both at UNH and across the globe. In just a short time the terms “data scientist” and “analytics professional” have pervaded the jobs spheres. This has created a tremendous opportunity for new career growth but also marketplace confusion, as people struggle to understand just what these terms, skills and jobs mean. Employers, feeling the pressure of the pace of exponential change, have cautiously rushed to counter the perceived disruption that our data and information age promises. The public too remains excited, but also confused, when confronted with a flood of new terminology such as machine learning, deep learning, and Artificial Intelligence.

In just the short time since our programs launched in 2014, the number of programs has nationally grown from 20 to over 200, many with different structures, learning modalities and application structures.

We feel fortunate to be part of a collective of interdisciplinary programs committed to the idea of application driven, real-world education. We believe data science is a team sport, best practiced with committed partners, and inclusive of the many lenses it touches.

Much has happened since our 2015-16 report. We have hired new faculty, expanded our online programs in data science and partnered with faculty on new and exiting endeavors in watershed informatics, electrical and computer engineering, climate change, health care, and supply chain analytics.

Our students completed over 18 projects in the past two years, gave multiple national presentations and have realized near 100% job placement and strong praise from our industry partners.

We hosted the first Northeast Big Data and Innovation conference with our local and national colleagues.

We also continue to plan for the future. The fall of 2018 will see the expansion of our physical space and the official launching of the UNH Center for the Analytic Sciences, something we call the Data Lab. It will be the formal front door for applied data projects at UNH, creating a collaborative workspace for industry, faculty and students to begin to solve the grand challenges of tomorrow.

We continue to grow, but we also continue to stay focused on our core values; Respect, Integrity, Curiosity, and Humility are what cement the foundations of all we do, believing strongly that together is better and that learning is a life long process we do in collaboration.

We thank you for being a valued partner in this journey and we look forward to discovering the future -Together.

We hope you’ll join us as we continue to Learn. Apply. & Lead!
ABOUT UNH ANALYTICS & DATA SCIENCE

OUR MISSION:
To train analytic and data science professionals who develop innovative solutions to real world programs and challenges through experiential learning and interdisciplinary teaching by practicing faculty, field experts and industry partners.

VISION:
The Graduate Programs in Analytics and Data Science at UNH are technologically sophisticated and ethical catalysts for change who, through innovative, interdisciplinary programs at all levels, help organizations achieve competitive advantage and work toward the betterment of peoples and societies.

RICH VALUES:

RESPECT: for individuals’ roles, diversity, contributions and viewpoints.

INTEGRITY: to have ethical behavior in our relationships, practices and decisions.

CURIOSITY: as a foundational, lifelong practice for comprehensive learning.

HUMILITY: to learn from others and remain teachable.
With Lyin Schramm, Academic Department Coordinator

Since its origination in 2015, the University of New Hampshire’s Masters of Science in Analytics programs has enrolled over 115 students. We have generated over $5 million in enrollment revenue and doubled enrollment in four years.

Our leadership team believes in offering current, cutting-edge analytics and data science skills to ambitious and curious students, who can then use their new skills to change the world. And they are doing just that. Our alumni have been employed in diverse industries, working for companies such as BAE Systems, Lindt & Sprüngli (USA), McKinsey & Company, Detroit Tigers, Lonza and Aetna.

Students and professors commit to a 1-year, boot camp-style program that allows them to fully immerse themselves in learning. This applied, truly interdisciplinary program fosters an environment where the brightest minds can challenge one another and build the foundations for lifelong learning.

Our students continually build their resume with technical skills, professional development and experiential education throughout the program. The Practicum Project, a 7-month hands-on consulting project sponsored by industry partners allows real-world problem-solving training.

This is a competitive, intensive master’s program for those who have a passion for data and a curiosity for life.

Communicating, Collaborating and Connecting

Development of the soft skills of business – communicating in multiple formats, teamwork and networking are strategically built into the programs. Here are some of the ways we connect:

- Our curriculum specifically fosters communication and data translation exercises, develops project management skills and promotes and evaluates individual knowledge as well as team participation and intelligence.
- Industry involvement has resulted in providing current practices and professional training to students through Practicum Project and Data Lab work, as well as recruitment.
• Alumni are engaged and give back with their time, talent and connections in the form of analytic presentations, projects, sharing current trends, advice, encouragement, philanthropy, and recruitment.

• Word-of-Mouth references are the second largest path for applicants to find their way into our classrooms. Many of our students found us by word-of-mouth recommendations from professors, colleagues, other students, and alumni.

• Collaborations across campus have helped us shape our programs, increase our knowledge through peer-learning, and become more efficient by sharing resources. We have partnered with UNH Enrollment Management, Career and Professional Success, the UNH Foundation, the UNH E-Center, the Connectivity Research Center, Innovation, UNH Facilities, UNH Online, and each of the UNH Colleges and UNH Athletics.

We also partner academically and through research. For a full list see page 16. Partnership is our model.

“Alone we can do so little; together we can do so much.”

~ Helen Keller
**Number of Countries of Origin for Students**

**Class of 2016-2017**
7 Total (China, Ecuador, Ethiopia, India, Nigeria, USA, Vietnam)

**Class of 2017-2018**
8 Total (Ethiopia, Ghana, India, Nigeria, Poland, Taiwan, Saudi Arabia, USA)

<table>
<thead>
<tr>
<th></th>
<th>Class of 2016-2017</th>
<th>Class of 2017-2018</th>
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<tbody>
<tr>
<td>Number of Students</td>
<td>27</td>
<td>28</td>
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<tr>
<td>N.H. Resident</td>
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<td>54%</td>
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<tr>
<td>International Student</td>
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<td>21%</td>
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<td>Average Years Since Undergrad Degree</td>
<td>6 Years</td>
<td>8 Years</td>
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<tr>
<td>Percent with Previous Graduate Degree</td>
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<td>Range of Age</td>
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<td>23-60 Years</td>
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<td>Percent Female</td>
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<td>43%</td>
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<td>With Prior Ph.D.</td>
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### PRIOR DEGREES OF STUDY

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<th>Field</th>
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<tr>
<td>Engineering &amp; Computer Science</td>
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<tr>
<td>Mathematics &amp; Statistics</td>
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<tr>
<td>Natural Sciences</td>
<td>14%</td>
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<tr>
<td>Humanities</td>
<td>11%</td>
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<tr>
<td>Social Sciences</td>
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### 2017-18 GRADUATES SALARY CHANGE*

- Average Salary Before Joining The Program: $48,000
- Average Salary After Completing The Program: $78,600
- Percent Salary Increase: 64%
- Initial placement rate post-graduation: >95%**

*Convenient sample.**Numbers varies over time as graduates change positions or are promoted.
The famous psychologist Anders Ericsson suggested the idea of the 10,000 hour rule, which was later made famous by my favorite author, Malcolm Gladwell, in the book Outliers. The rule suggests that if one practices a craft for ten thousand hours as consistently as at least a half-time job for a decade or more, then they become highly proficient in that skill, maybe amongst the best in the world. The book provides common features in the personalities of renowned craftsmen, sportsmen, businessmen, etc.

Neither Anders nor Malcolm mentioned the important ingredient necessary for those ten thousand hours to occur. In my opinion, that ingredient is not social pressure, the grand prize, fame or any other tangible reward, but it is genuine curiosity and interest that provides a special utility to the soul that keeps the person going for such a long period of time. I don’t believe that a reward can motivate someone to practice or perform a craft while constantly improving, unless they are genuinely invested in it. Teaching is that craft for me, and I have a long way to go.

I have taught quantitative subjects including Statistics, both in Business Analytics and Life Sciences (Biostatistics), Machine Learning, Text Analytics, Bioinformatics; Health Analytics, Algebra and Geometry, and Computer Programming in several languages at three universities at undergraduate and graduate levels. I have taught more than 125 semester long classes and more than 4,000 students from all backgrounds, nationalities, educational and professional experiences. Some were curious and others were not, some were motivated and others were complaining.

By a rough estimate, I have delivered over 6,000 hours of lectures not including conferences and other professional presentations and guest lectures. While those are impressive statistics, I am only a little over half way through by the standards of the book Outliers. The opportunity to learn and improve is still strong for at least two more decades before I can safely hand on the responsibility to the next generation.

Teaching is precious and pious, difficult and exhilarating, stimulating and nerve-racking but never dull or boring. It teaches me to learn from failures, and it constantly provides me with opportunities to both learn and fail.

The field of data science is in constant influx, and newer or better ideas are introduced constantly by the community.
of researchers. Such a kinetic state of knowledge is exciting, as it constantly keeps changing methods and opportunities for learning. It’s clichéd, but as I like to say, I spend somewhere between three to six hours preparing for every one hour of lecture. My preparation is very regimental and incremental, regardless of whether I have taught that topic before or not. The preparation goes through several phases, and I often have trouble sleeping on the days of lectures as I end up waking and pondering over the flow of the class, examples, jokes and most importantly, relevance of the topic.

Another one of my many rituals is to listen to my favorite song on my way to class. Sometimes all of this preparation, lack of sleep and my rituals are still not enough and the lecture doesn’t go as expected, a.k.a. I fail at the proper implementation. I try to learn from such experiences and just like any other profession, those are just good or bad days, and they don’t make me a good or a bad teacher.

Curiosity is an agreement with yourself to keep looking until you find it. Curiosity is different from objectives or goals in the sense that it never ends.

As a teacher I aspire students to be curious, to learn the what, why and where of a topic or discussion.

What is the theory, why is it relevant and where can they apply those fundamentals are the main questions I try to address in each lecture. The best way of judging whether a student has grasped all three W’s is to hear it back in their own words. Since there is no uniform way of expression, either in speech or writing, I assign both report writing and verbal interviews as the primary forms of student assessment. I create groups of five to seven students and interview them for over an hour, free flowing around various topics that were discussed in the class. It is not a comfortable feeling to teach the teacher on the spot and on demand while grappling with peer pressure from fellow students watching you explain the intricacies of a cost function, the curse of dimensionality or the hyper parameters of a neural network. Students shine and crumble, they laugh and cry, they love and hate the experience, feel vulnerable and uncomfortable, but almost everyone finds it extremely rewarding. In the end, the experience leaves them stronger.

I wish to remain an unconventional teacher who enjoys reading and recommending books liberally, who is enthusiastic about the thrill of the classroom, and who wants to teach as long as the joy of learning is alive.

~ Professor Mittal
MASTER OF SCIENCE IN ANALYTICS CURRICULUM OUTLINE

The Graduate Programs in Analytics and Data Science utilize an innovative hub and spoke curriculum with a modular format. Students take courses in traditional semesters: summer, fall and spring. Each semester is defined by four courses, listed in the below map. Each course, however, is further divided into sub-modules that vary in length of instruction. The summer semester represents the introductory period of the program, the fall an intermediate level and the spring more advanced and application driven instruction modules. Students in each course may be taught by a variety of instructors through its duration. Students in the fall and spring conduct a practicum on real industry data, and on which methods are applied. In addition, students also then take a two course specialization cluster on a field topic of their choosing.

Master of Science in Analytics Curriculum Outline

<table>
<thead>
<tr>
<th>Modules</th>
<th>Sub Modules</th>
<th>1 Summer</th>
<th>2 Fall</th>
<th>3 Spring</th>
<th>Semester/ Course Number/ Course Name</th>
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<tr>
<td>Algebra</td>
<td>Matrix Algebra</td>
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<tr>
<td>Business</td>
<td>Customer Analytics &amp; Segmentation I &amp; II</td>
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<td>Intelligence</td>
<td>Optimization &amp; Risk Analytics</td>
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<td>Data Architecture</td>
<td>Big Data I &amp; II</td>
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<td>Hadoop, AWS</td>
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<td>Neural Networks &amp; Deep Learning</td>
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<td>Simulation</td>
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<td>Text Mining I &amp; II</td>
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<td>Compatibility Across Softwares</td>
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<td>Bayesian Analysis</td>
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<td>Computer Vision</td>
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<td>Practicum Programming</td>
<td>Summer Practicum &amp; Industry Project</td>
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<td>Data Cleaning and Management I &amp; II</td>
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<td>Python: Beginner, Intermediate, Advanced</td>
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<td>Data Exploration &amp; Imputation</td>
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<td>Intro. to Predictive Modeling</td>
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<td>Multivariate Techniques</td>
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<tr>
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<td>Advanced Predictive Modeling</td>
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<td>Design of Experiments</td>
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<td>Visual Analytics</td>
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<td>Geographic Mapping using QGIS</td>
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Note: Denotes number of weeks
X - Semester Long
“GREAT WISDOM, NOT APPLIED TO ACTION AND BEHAVIOR, IS MEANINGLESS DATA.”

- PETER DRUCKER
Dr. Phani Kidambi (PK) joined the Analytics and Data Science program at UNH as a lecturer, program coordinator for the Online Graduate Certificate Program in Data Science and an actionable data insights strategist for the Graduate School. Prior to joining UNH, PK served as a Data Scientist in the Customer Experience Strategy Team at Wells Fargo and as a faculty/administrator/researcher at Wright State University.

PK’s major accomplishments include quantifying customer experience emotions with TouchID and Mobile Remote Deposit Capture products at Wells Fargo, increasing Wright State’s international enrollment by over 80% in a period of 18 months utilizing data science techniques, generating over $7 Million in research/service contracts, publishing over 25 technical articles and winning two teaching awards.

His research interests are in the areas of Data Science, Business Intelligence, Decision Support Systems, Data Visualization & Story Telling, Pattern Recognition, Information Retrieval, Image Processing, Human Computer Interaction, Customer Experience, Affective cues, Culture and Entrepreneurship.

You are an engineer by training, what drove you to the field of analytics and data science?

During my dissertation on Content Based Image Retrieval, I delved into the areas of machine learning and artificial neural networks. That was my first foray into Analytics & Data Science (though it was not known as Data Science in 2008-09). Soon after that I started applying the principles of Data Science into improving international enrollment in a university setting. I established a data driven decision-making unit that cut down the application to decision time frame from 4 months to 6 weeks. This resulted in the
international enrollment growth from 1000 students to over 1800 students in an 18-month period. This experience helped me understand the power of Analytics & Data Science. I was then promoted to lead a private-sector style internal consulting unit to enable and empower the university community to achieve its strategic plan with the highest levels of efficiency and effectiveness. The unit acted as a force multiplier by supplying protected bandwidth to the much-desired improvement efforts which often fall prey to the urgency of day to day operations. Without using Analytics & Data Science, none of these efforts would have been successful.

What was it about UNH (or the UNH Program) that brought you here?

The Analytics & Data Science program at UNH is what brought me here. This program was one of the first few programs that were established in the entire world. I was excited when I was called for an interview. Specifically, I was amazed on how more than 40% of the course content changed every year across many courses within the program, and the aspect of collaborative teaching. Collaborative teaching brings new and unique perspectives and learning to our students, and provides faculty with new ways of thinking, interacting, teaching, and researching. Though collaborative teaching is not yet commonly practiced across many institutions in the US and across the world, the UNH Analytics & Data Science team has perfected this art. And most importantly, I really enjoyed talking to various UNH stakeholders during my interview process and after talking to three specific people, I decided to come to UNH provided I was given an opportunity.

What have you enjoyed most thus far, and what are you excited for?

I have enjoyed the amount of academic freedom that I get with regards to the course content in the class coupled with the wide array of student perspectives, thanks to their varied backgrounds, which results in fantastic multidisciplinary and interdisciplinary discussions around Data Science. I have also enjoyed working on UNH projects that generate actionable insights and improve the system processes. I am also thankful for all the mentoring that I receive when I seek it out.

“Professor Kidambi is an enormously driven person and his dedication to his students is remarkable and admirable. He seems to have endless energy and he helps his students succeed by providing frequent office hours and teaching them the tools and techniques they need to succeed...He throws you in the deep end and provides honest, direct, and professional feedback... It’s people like him that make this program worth attending.”

~ Alumnus, Class of ‘18
Reflect on your evolution in working with data and data systems and how you came to be partnered with the Analytics and Data Science programs.

As a computer scientist, my first encounter with data was through my database systems course, when relational databases were very young. CJ Date was the textbook author who taught my generation the basic concepts of data organization. Coupled with a strong understanding of COBOL, the common business-oriented language, many of my undergraduate contemporaries were being drawn into organizations to store and present data in report formats that allowed for business leaders to make better decisions with current information. Today, the computers are faster and the languages are more varied, but the problems and solutions are the same—how do we get good information from the data that we have?

When the Analytics and Data Science program was being developed, I was brought into an initial interest meeting with Dr. McGrath and Professor Mittal by the Computer Science Department Chair Dr. Bartos. I knew that data organization and architecture are key building blocks for starting any data analysis endeavor, going back to the direction and guidance written by CJ Date, so my intention was to join in the meeting encouraging the Analytics and Data Science program leaders to emphasize that in their curriculum. As often happens when one raises one’s hand, the idea was recognized as tremendously important, and I was asked how much time I needed to create the module to cover those key concepts in the program. And I’ve been teaching the module on data architecture, and now a whole course on it (DATA821), as part of the program ever since that initial meeting.

Where do you see the world moving and how is a program like this helping to meet that future need?

One unique aspect of the Analytics and Data Science program are the capstone projects that run throughout the year. Students are assigned to projects that have been proposed by industrial partners, and those projects are real. Students work closely with the company representatives to identify the problem or question that the company is trying to address, applying most of the skills learned throughout the year in designing an approach that might generate a valid answer. Usually, the
data has the answer to the question embedded, and like a master carver, the students need to chip away the parts of the artistic medium to reveal the masterpiece inside. This approach has led every project to reveal important directions for their corporate partners and demonstrates to the students that they have the knowledge and skill to make changes in any environment.

We see already how data impacts our lives and the decisions we make. We are going to see much more data become available to us. The most useful data will be integrated into our everyday applications and resources, such as smart phones and smart appliances. Connecting data of a similar type is where we are today—health data with insurance claims data, or weather data with tourism revenue. Yet, the most disruptive use of data is yet to come, where data from seemingly unrelated sources are found to have a relationship. Does data from grocery store sales tell us anything about community health or education? Maybe not, but there are lots of data out there just waiting to be explored.

**What are the big challenges of the future?**

There are many grand challenges in Data Science.

The first challenge is already impeding our work today around the reproducibility of results. Peer-reviewed science is a critical component of advancing our knowledge of any discipline. Many of the data science projects we encounter are crippled by non-public data or data that has been redacted or de-identified to protect the owners of that data. As a result, what we think we are learning cannot be verified by other data scientists because they cannot get access to the same data. This problem is somewhat technical and largely policy or legally driven. We need to educate a great many disciplines about the needs and benefits and work together to reach adjustments to rules, policies, and laws that make data difficult to use.

The second challenge surrounding data science is around uncertainty and assumptions. Our human nature compels us to make assumptions to explain what we observe or deal with the myriad of options available that introduce uncertainty. Human history is filled with legends and myths of why the world around us behaves as it does. Even with data at our disposal, we need to address uncertainty and assumptions better than we have done up to now. Prior to large scale computing resources, mathematicians would make assumptions in algorithms in the hope of being able to solve the problem. Today, we can process an algorithm over a dataset using a high-performance computer (HPC) over multiple iterations using a litany of assumptions and then review the output to determine what conditions or assumptions lead to the best decisions.

The third challenge facing data scientists is the need to maintain knowledge and skills in an ever-changing world in disciplines that require knowledge that is ever growing. Through advanced computation, we are able to extend mathematics and statistics to levels that our minds have been unable to handle alone. Yet, knowledge in mathematics and computer science are not enough to properly apply these skills to the long list of disciplines that need these tools. Data scientists need to be able to partner with other disciplines and connect the disciplinary needs with the algorithms of statistics using the code development and processing of computer science. These three legs of the stool need to be solid in order to make any advances.

When I reflect on these big grand challenges in Data Science, the UNH Analytics and Data Science program is working to address each of these issues, turning out new professionals who can address any one of these challenges if their career path moves them in that direction.
The Dinesh Thakur Scholarship is conveyed each year to the student or students who wish to make a difference through informed data driven change in the health care fields.

In 2016, Hailey Bodwell was the student awarded this prestigious award. Hailey received her BS in Health Management and Policy in 2014. She then went to work for Wentworth-Douglass Hospital and quickly realized the importance of data-driven decision-making in the healthcare environment.

Hailey currently works as a Clinical Data Analyst for Catholic Medical Center in New Hampshire. Hailey is confident in her current role due to the multi-faceted approach of the Analytics program, which stresses the importance of analytical understanding as well as real-world application.

Our first 2017 recipient was Ms. Caroline Lavoie. Caroline joined us from Rochester, New York via Oxford Ohio and has worked in several not for profit organizations including as a Practice Manager for a healthcare facility that served the uninsured in the community.

It was there that she formed a passion for health and the improvement of care through data analytics. During the Analytics program, Caroline worked on data examining the availability of insurance plans offered through the Affordable Care Act and a practicum project with Martin’s Point HealthCare. She says the program has also strengthened her belief that the utilization of analytics can bring substantial, lasting and positive change to health care.

Our second recipient was Dan Walsh. Dan founded and served as the program coordinator of the New Hampshire Med Bank, NH’s only charitable pharmacy. He left the Foundation in 2017 to pursue his MS in analytics.

During the program, Dan worked with the Elliot Health System and Avant Course for his practicum projects, focusing on falls related patient data and weather station reliability respectively. He’s also done various other projects related to the extreme sports communities, most notably with student colleague Serina Brenner for regional Tableau user groups.

2016-2017 INDUSTRY PRESENTATIONS

JUNE - Fit Bit, SAS Training, Martin’s Point

JULY - Darling Consulting, SAS Analytics Conference

AUGUST - CA Technologies, SAS Analytics Conference, Liberty Mutual

SEPTEMBER - Weather Analytics, UNH Innovation

OCTOBER - SAS Analytics
2017 PRACTICUM PARTNERS
Granite State College
Martin’s Point Health Care
CA Technologies
Darling Consulting Group
Unum Insurance
winningAlgorithms
Elliot Hospital

2018 PRACTICUM PARTNERS
Elliot Health System
Unum
Martin’s Point
UNH Career Placement & UNH Institutional Research
Avante Course
Arkatecture
National Institute for Occupational Safety and Health
Darling Consulting Group
Lindt & Sprüngli (USA)

We welcome new project partners. For more information about becoming a partner, contact UNHAnalytics@unh.edu
What is the GCDS program?
The University of New Hampshire’s Online Graduate Certificate in Data Science, re-established in January 2018, exposes students to current, cutting-edge algorithms, coding languages, statistical modeling and visualization tools through guided, online instruction and applied case studies. Graduates of this program will be able to:
• Connect analytics to actionable insights that you can take back to your organization.
• Gain mastery of Python, using it to wrangle and explore data.
• Learn to build out cross-validated predictive models, selecting and engineering the best features and learn how to turn it into reproducible data products.
• Master the fundamentals of SQL and NoSQL databases and gain practice in distributed computing.

This graduate certificate program offers a short-turnaround time to completion allowing busy employees to participate. Enjoy applied learning in an asynchronous but facilitated environment with course instructors and a student success coach.

Who is it for?
From our perspective, the most important trait for a career in Data Science is CURIOSITY. Professionals who find pleasure in uncertainty, challenge assumptions, notice what others miss, step back, have a beginner’s mind and want to increase their earning potential, advance their careers, and make a greater impact within their business or organization with advanced data analytic and coding skills are the right fit for the program.

“In the beginner’s mind there are many possibilities, but in the expert’s there are few.”

~ Shunryu Suzuki

This certificate is beneficial to those in the fields of:
• Business Analytics
• Data Analytics
• Financial Analytics
• Computer Science
• Programming
• Database Administration
• Research
• Statistics
• Marketing

2017-2018 Industry Presentations

Martin’s Point
SAS Training
Strata Hadoop Conference
UNH Northeast Big Data Conference
Elliot Health System
Amazon Alexa
UNH Research & Compliance
Bottomline Technologies
Arkatechture
Lindt & Sprüngli
How do we differentiate ourselves?

We offer weekly individualized zoom sessions for students to answer any of their questions. Additionally, at any point during this program (and beyond), if students would like to talk to us about a specific dataset related to their organization that they need help with, we offer our expert insights expecting nothing in return.

What does the future for Analytics & Data Science look like in the UNH online space?

We are in the process of building certificate classes in R programming (to complement Python programming). Another class that we are excited to bring in the near future is on Data Visualization & Story Telling. One of the most critical skills that differentiates a good Data Scientist/Analyst versus a great one is the ability to present the analysis and insights of their data for different audiences and stakeholders in a variety of formats: static vs. interactive vs. dashboards vs. infographics). Our goal is to teach the students visualization skills necessary to be effective Data Storytellers which helps engage their audience in a story about the data. We will focus on concepts as well as hands-on experience of presenting data from initial concepts to final presentation by creating meaningful displays of quantitative and qualitative data to facilitate peer/managerial decision-making using Tableau. Finally, discussions are also in place to introduce an online Professional Doctorate program in Analytics & Data Science.

2017-2018 INDUSTRY PRESENTATIONS

NOVEMBER  DEC  JAN  FEBRUARY  MARCH  APRIL

Red Sox  Walmart  Weather Analytics  McKinsey & Company  comScore, Inc.  SAS GF

Mad Pow  BAE Systems  LL Bean  INFORMS Business Analytics
I received a B.A. in Economics from Ithaca College. I then spent time teaching English as a Foreign Language in Vietnam.

I am currently a Statistical Analyst at Equifax, where I am working with big data to build credit score models for the banking and lending industry.

The M.S. program in Data Science and Analytics at UNH has been truly life changing. In one year, I acquired a set of skills that was formerly incomprehensible, enabling me to make the career switch I was striving for. It was hectic and often described as a pressure cooker, but the program’s environment pushed me to be competitive, collaborative, and fully immersed in data science. The projects, hackathons, and homework assignments taught me to multi-task and think critically. The “interviews” prepped me to feel comfortable communicating subject matter that is not easily digestible. The partnerships with local companies exposed me to how data science and analytics currently exist across different industries. The inspirational professors instilled in me the importance of curiosity, creativity, and self-motivation. This program is uniquely multidisciplinary and prepared me to pursue a career as a data scientist. The skills I learned at UNH are central to my new role at Equifax, where I am tasked to build predictive models and use languages like SAS and SQL every day.

Data Driven Women is a club that Kate Cunningham, Lyin Schramm, and I were inspired to start after attending a Women in Data luncheon at the Strata Data Conference in September 2017. As graduate students, we could feel the gender disparity in our chosen field and wanted to create a space for our classmates to discuss their experiences as women pursuing a male-dominated industry. Our club’s mission is to build a supportive community of graduate learners to address the gender gap and promote the success of women in the ever-changing landscape of data. Kate, Lyin and I acted as club officers and worked together to schedule guest speakers and plan activities for our regular meetings.
SHANE PIESIK, ‘17
BASEBALL ANALYST, DETROIT TIGERS

My interest in baseball analytics stems from my passion for the game and data. Attending conferences such as SABR Analytics, Saberseminar, and Sloan Sports Analytics Conference while attending UNH was helpful. By attending conferences, I was able to identify the skills that I needed to work at, the useful skills I already had, and those I was building.

In my current role at the Detroit Tigers, I rely on the skills I built from the ground up at UNH Analytics including R, Python, and SQL.

I have worked as a sports Analytics Consultant for UNH Hockey. Other projects I have worked on include:

- Student consulting where I created a framework that identifies patterns in customer behavior using unsupervised machine learning.
- Differentiated Expectancies and Baseball Ranking Algorithms (DEBRA) where I developed a system that clusters MLB players and forecasts performance. All computation was executed with Python (i.e. scikit learn, pandas) and R (i.e. dplyr, glmnet, sqldf).

- Utilized fixed effects regression to estimate the marginal revenue product of MLB pitchers.
- Seacoast Mavericks – Future Collegiate Baseball League, Operations Intern, where I assisted in sales, public relations, social media, and marketing.
THOMAS COOK, ‘18
BAE SYSTEMS

My background is in Economics and Finance. I went to Bowdoin College and majored in Economics and, after a stint in AmeriCorps, I joined Fidelity Investments. I got interested in analytics as a way to take the next step in my career towards using data to solve increasingly complex problems. The roles that I wanted to pursue required a number of skills that I lacked like an in depth understanding of machine learning, visualizations, and programming. As soon as I saw the Master's in Analytics and Data Science at UNH, I knew that it would be the perfect fit to fill in those missing skills necessary to progress in my career.

I started working at BAE Systems following my graduation in May 2018. I am currently a data analyst on a team working to improve BAE’s use of data and their data governance policies. It’s very fun and interesting work. A company like BAE generates all kinds of interesting data and ensuring that it’s accessible, reliable, and in front of the right people is essential. My team is working to make sure that is the case. I cannot get into the specifics, but we get to do some pretty cool business intelligence work to help our colleagues get questions answered quickly and see their data from a new perspective. I have been there a little less than three months and already feel like I am making an impact with the skills that I learned at UNH.

The M.S. program prepared me for my new role in a number of ways. First and foremost, the analytic approach that Professor Mittal and Professor Kidambi drilled into us has enabled me to successfully tackle projects at work. I prepare presentations weekly and am working in R, Python, or both everyday so I am glad I got experience coding both languages and in creating impactful visualizations. One lesson learned during the program was that success does not necessarily mean that you had the most clever idea, but, rather, that you looked at the data or the problem from the most perspectives. By doing this, you can challenge your preconceptions, uncover new insights, and deliver the most complete results. You end up going down a lot of dead ends this way, but in the end its worth it. Lastly, Professor Mittal always reminded us that we would have to be open to continuous learning and to be tool agnostic. Analytics is a fast moving field and we all need to be open to learning new techniques and tools. This lesson has definitely proven valuable in my new job.
PATENTS:

PAPERS:

PRESENTATIONS:
- 2018: INFORMS Business Analytics Academic Directors: McGrath, RJ. Strategic Engagement Across the Continuum

GRANTS:
National 2017-2018:
- NSF 18-520, Smart and Connected Communities (S&CC): Smart and Healthy Portsmouth (CO-PI).
- NSF 18-507, National Science Foundation Research Traineeship (NRT) Program: Watershed Informatics (CO-PI)
- NSF 16-510. Big Data Regional Innovation Hubs: Establishing Spokes to Advance Big Data Applications. Planning Grant. Data Literacy (Partner)

UNH CORE 2018:
- Watershed Informatics. Co-Sponsor

WORKING GROUPS:
National:
- Northeast Big Data and Innovation Hub: Data literacy and Data ethics working groups.

UNH:
- Watershed Informatics working group
- Smart Campus Master Plan Working Group
- Center for industrial Internet of Things: Industry 4.0 Workgroup

ANALYTIC SERVICE TO UNH PARTNERS
- Graduate School
- Enrollment management / Institutional Research
- Career and Professional Success
- UNH Online
- College of Liberal Arts
- College of Health and Human Services
- UNH Advancement
- UNH e-Center
- UNH Innovation
- UNH Football & UNH Hockey

* University of New Hampshire; **Kennesaw State University, ***Weill Cornell Medicine, ****Microsoft Research AI
WHO WE ARE: PROGRAM FACULTY & STAFF

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Clinical Assistant Professor

Lyin Schramm
Academic Department Coordinator

Phani Kidambi
Lecturer and Program Coordinator of GCDS

INTERDISCIPLINARY TEACHING FACULTY 2016-2018

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Professor
Philosophy

Jeremiah Johnson
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UNH Hockey
UNH Football
University of New Hampshire
UNUM
U.S. CDC/NIOSH
U.S. Dept. of the Navy
Vyasa Analytics
Wildcat Sports Properties
HIGHER EDUCATION NEEDS A NEW MODEL AND A NEW ORIENTATION...UNIVERSITIES MUST BROADEN THEIR REACH TO BECOME ENGINES OF LIFELONG LEARNING

~ JOSEPH AOUN*
University of New Hampshire
Analytics & Data Science
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