



University of Virginia
School of Data Science

Dean Philip E. Bourne



SCHOOL *of* DATA SCIENCE



What is Data Science?



Acute Care & Trauma Surgery

UVA's Division of Trauma and Emergency General Surgery provides patient care services for traumatic injury in central Virginia. UVA is a Level I Trauma Center and functions as an entity within the Clinical Care Services of the UVA Health System.



The Adult Trauma Service admits approximately 1,100 severely injured patients per year. The Pediatric Trauma Service admits approximately 175 patients between the ages of 0 – 17 per year. There are approximately 1,900 injury admissions per year to the medical center. Under the direction of Jeffrey [redacted], two Critical Care Resid [redacted] general surgical and or [redacted]

ed by a Chief Surgical Resident. The service also cares for



<https://www.freep.com/story/news/local/mc/2018/09/13/9-year-old-girl-killed-car-crash-car-alleged/>



<https://www.thirdway.org/report/6-lifetime-electronic-health-record-for-every-american>

Researcher and Assistant Professor of Medicine Dr. Thomas Hartka, also a current online Masters in Data Science student, is combining two disparate data sets—electronic health records and DMV crash data—to save lives after motor vehicle crashes.

“I enrolled in the MSDS program to expand my research on automotive safety. I have already used techniques from classes in my work. I hope to expand my research to real-time analytics to improve emergency room care.”

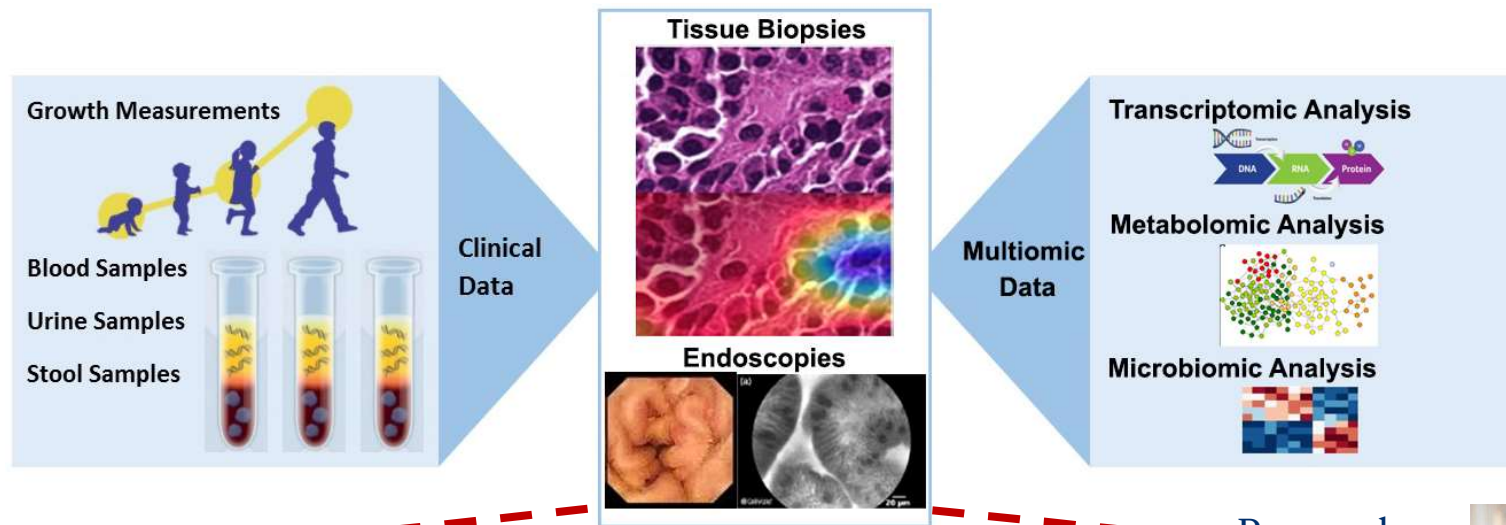
— Dr. Thomas Hartka, UVA School of Medicine



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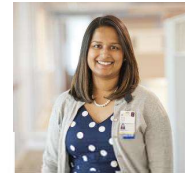
Artificial Intelligence/ Machine Learning in Medicine

Recognition of microscopic GI patterns and key disease drivers



**Artificial Intelligence
powered disease insights**

Researcher:
Sana Syed



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Increased Demand over the Past Five Years

↑ **74%**

Artificial Intelligence Specialists

Top industries hiring this talent: Computer software, internet, information technology and services, higher education, consumer electronics

↑ **37%**

Data Scientist

Top industries hiring this talent: Information technology and services, computer software, internet, financial services, higher education

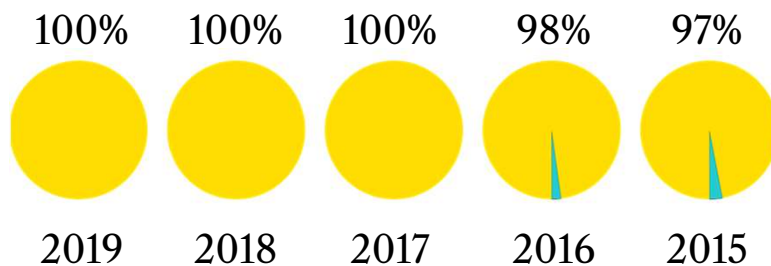
↑ **33%**

Data Engineer

Top industries hiring this talent: Information technology and services, internet, computer software, financial services, hospital and healthcare

The Rising Demand for Data Scientists

UVA School of Data Science Graduate Job Placement*



Roles

Machine Learning Engineer, Director of Data Science, Deep Learning Research Scientist, Senior Data Analyst, Data Science Developer, Consultant, Product Data Analyst, Financial Engineer, Engagement Manager & more

Industries

- Finance
- Government
- Healthcare & Medicine
- Professional Sports
- Commerce
- Media
- Higher Ed
- Technology

*for graduates seeking employment

Applying Data Science Across Industries



“I want to use data science to solve complex business problems.” — Ruslan Askerov, MSDS ‘21

“To address poverty and income inequality.”

— Arti Patel, MSDS ‘20



“To tackle challenges in science and medicine.”

— Elizabeth Driskell, MSDS ‘20

“To inform public policy and government.”

— Bradley Katcher, MSDS ‘20



“I want to use data science to find a new way of thinking.” — Alex Gromadzki, MSDS ‘21



SCHOOL of DATA SCIENCE

A New School for a New Century

A School Without Walls

Mission

To be a national and international leader in *responsible* data science emphasizing interdisciplinary collaboration which results in *furthering discovery, sharing knowledge, and societal benefit*

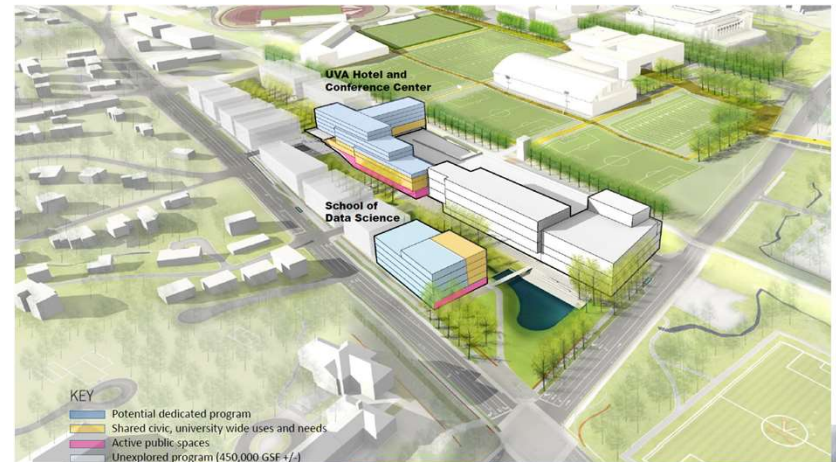


A New School for a New Century

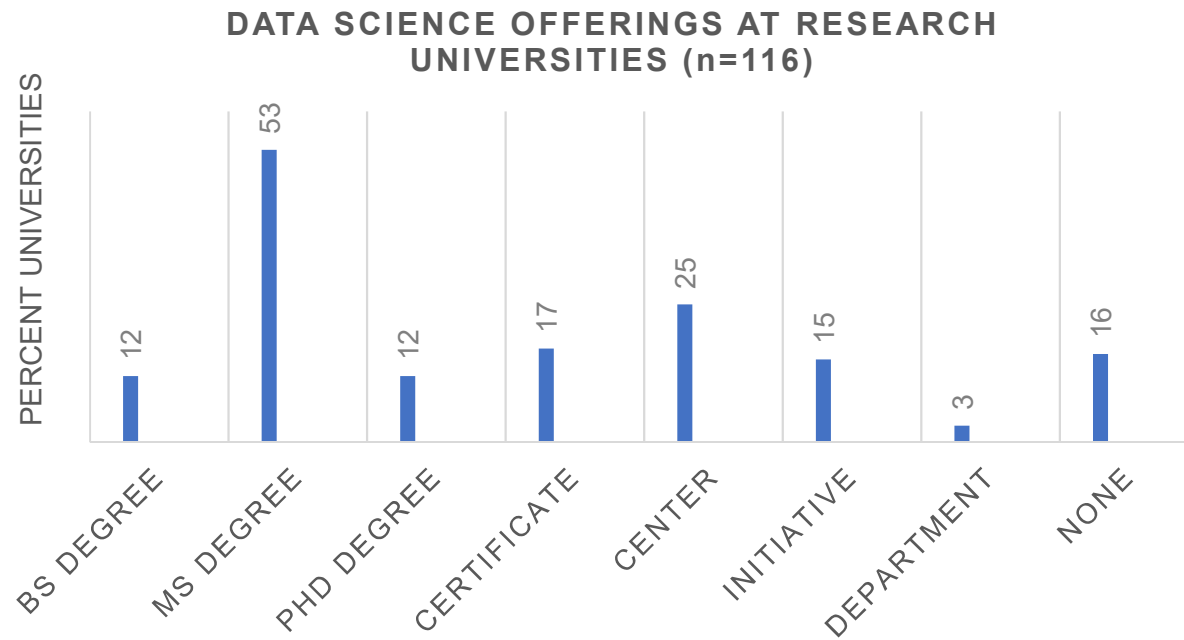
Where we are Today

Foundation

- Residential & Online **Masters in Data Science**
- **Presidential Fellows**
- **PhD & Undergrad programs** in process
- Hiring & recruiting **leading faculty**, with 10+ faculty and associate dean hires underway
- Research & community projects underway
- New building plan as **cornerstone of Emmet/Ivy**



We Are Not Alone, But We Are Unique



Furthering Discovery to Build a Better World

Democracy

Investigating how terrorist groups recruit women through propaganda and examining risk and threat assessment for extremist violence perpetrated by women.



Education

Helping economically disadvantaged, underrepresented populations pursue tailored educational workforce pathways that have a higher probability of leading them to success.

Business

Discovering what makes a job interview successful for the candidate and the recruiter, and how to mitigate bias in the recruiting process



RESEARCH



Cybersecurity

Detecting broad-spectrum cyber threats almost immediately after they are launched through a \$7.6 million Defense Advanced Research Projects Agency (DARPA) grant.

Health & Medicine

Securing high-performance computing equipment and personnel to allow collaboration across the university on brain science research like Autism, Alzheimer's, mental health disorders, traumatic brain injuries and more.



Environment

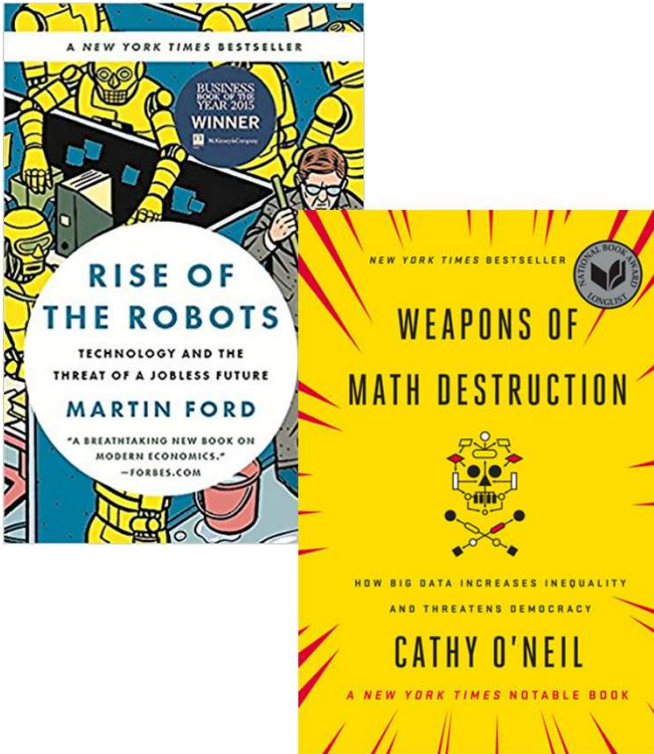
Using NASA data collected aboard the International Space Station to examine climate change in the Shenandoah National Forest and beyond, and find solutions



UNIVERSITY
of VIRGINIA

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Why *Responsible* Data Science?



- A defining feature
- A partnership between STEM, social sciences and the humanities
- Where UVA has strength



Challenges

- Deciding what not to do
- Competition for the best team members (faculty and staff)
- Establishing a diverse team
- Lack of a comprehensive enterprise-wide data infrastructure
- It's easier to conform

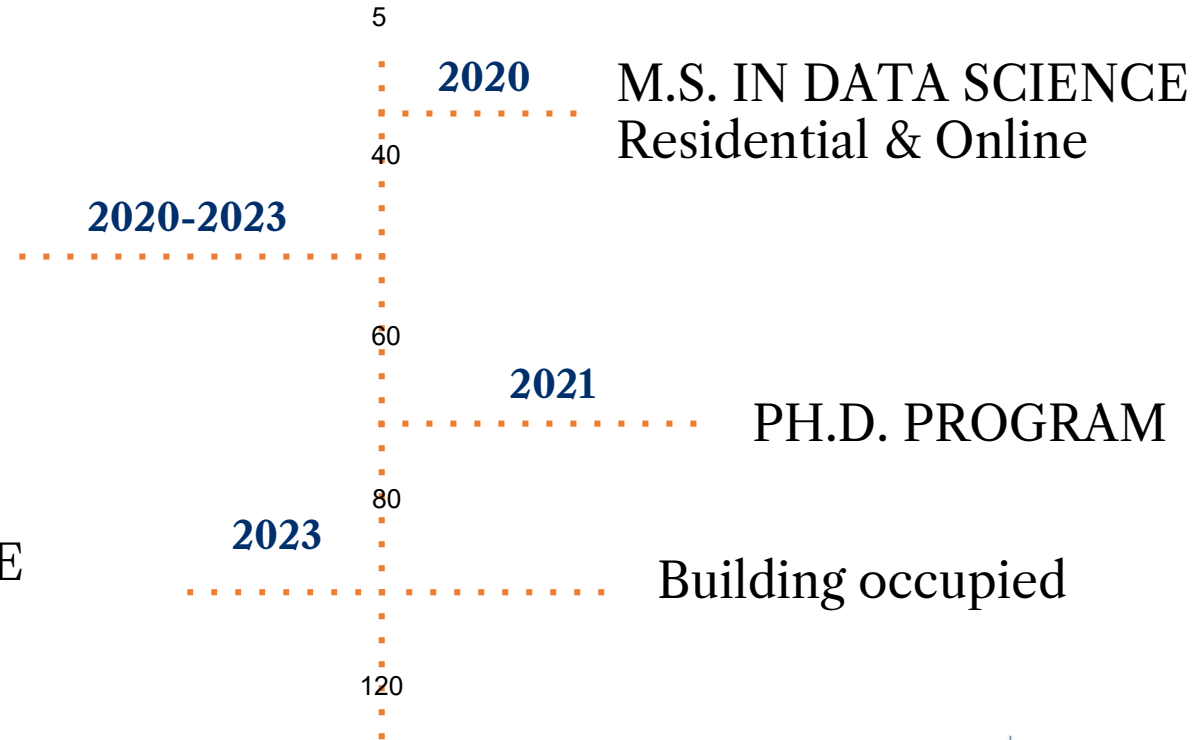
Growing the School

Growth of UVA Data Science Faculty & Staff (FTEs)

UNDERGRADUATE COURSES

↑ increase to 18 courses per AY

UNDERGRADUATE MAJOR



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Question

Given this wealth of opportunity and growing resources, what additional opportunities should we be taking advantage of?