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# A Systemic Approach to Understanding the Natural World

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**Rice University's Environmental Data Academy**

## Introduction

My discovery for data science started when I stumbled upon the Google Data Analytics course summer of 2024. From it, I completed multiple of their courses and got certificates for it as well. My passion for data analytics lies within my sense of curiosity and my love for deductive reasoning.

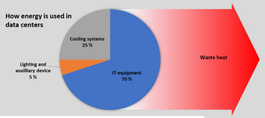
Throughout the course of my life, as I grew up I also developed a hobby for running and with that comes my awareness for the environment and my passion for global warming.

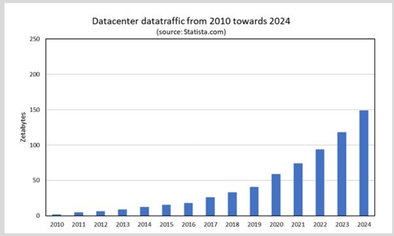
Weaving my passions together, coincidentally, I was offered an opportunity to apply for the Rice Data Academy with sustainability elements. This was nothing short of exciting for me and the exact path of trajectory I want to take with my career.

## Being Aware of Community Environmental Impact

Being aware is a key component for the first part. Learning about the fifth ward Kashmere garden with the Union Pacific in the railroad site. For years, residents of the fifth ward couldn't understand why people around were getting cancer. A deeper analysis of environmental soil sampling revealed that properties that were near the Union Pacific Railroad site had dioxins found in all of the soil samples. Dioxin is a highly toxic compound and is associated with liver cancer and other health risks. Union Pacific is now responsible for paying up to 100 million dollars to repair the damage it has caused.

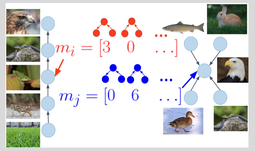
Furthermore, analyzing e-waste in the context of data centers revealed the heat produced by those centers contributing to climate change. That left me with some thought exercise of the fact that ethics to build and develop data centers is becoming more nuanced considering the tradeoffs in need of computational power and climate impact.



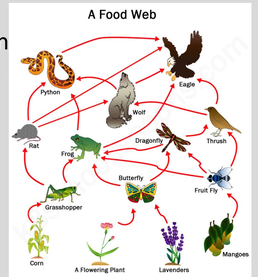




## Approach Drives Solution

In the second meeting, as we utilized python to visualize data, it changed and challenged my perception of data analysis through coding since I once only thought data analysis was just a bunch of spreadsheet work.




The analysis of motifs and food webs put into a surprising perspective for me on how to use this even outside of a food web ecosystem. An example such as product management on which can be taken off shelves or how companies' products are connected to each other, and which one is most dangerous to be going off sale. The most important thing here for me is being able to see each step taken very meticulously, in the grand scheme of things, the question of "how can I determine which species will endanger the ecosystem the most?" It is a difficult question. But being able to break that down step by step and quantify it in such a way where each step feels closer to the solution thrills me here.




## The Importance of Data Collection and Unbiased Data

Learning about seed dispersal from animals in dead forest areas has shaped my perspective very differently about how animals itself can have a huge impact on the ecosystem. This sparked my interest in ecology and my curiosity to learn more on how animals affect sustainability.

I have gotten the chance to discuss with Dr. Myers about the disinformation in data and how we can combat that. I learned that unbiased data is a very important and complex issue that came down to a lot of factors. When analyzing it, it is a very nuanced problem that requires diversity and inclusion within the field to get all perspectives of the coin in order to keep the data truly unbiased when analyzed by humans that are naturally biased. This led to my realization of the importance of diversity within any workplace or setting in the field of data science.

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## Conclusion

Throughout this experience, a huge takeaway for me was a systemic approach data. From approaches to tackle data to visualization using codes, it has transformed my views of data analytics in many ways.

Academically, I believe that this experience contributed to my passion in learning about mathematics and how it connects to data analytics. Professionally, it has put even more of a drive and emphasis on me pursuing data analytics and data science. As it pertains to it being more than just spreadsheet work.

## References

**"Industry Poisoned a Vibrant Black Neighborhood in Houston. Is a Buyout the Solution?"** *Houston Public Media*, 6 Mar. 2024, www.houstonpublicmedia.org/articles/news/energy-environment/2024/03/06/479784/industry-poisoned-a-vibrant-black-neighborhood-in-houston-is-a-buyout-the-solution/.

**"This Is How We Reduce Data Centers' Carbon Footprint."** *SINTEF*, www.blog.sintef.com/digital-en/this-is-how-we-reduce-data-centers-carbon-footprint/. Accessed 11 Apr. 2025.

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