Breaking Barriers in STEM/STEAM Fields

CARICOM Girls in ICT Partnership 2023
October 13, 2023

Presented by Dr. Letetia Addison
The University of the West Indies,
St. Augustine Campus

Consider this...

Women account for roughly 55 percent of university graduates on average across countries

Only two-thirds of this pool pursue STEM-related careers

About 15% to 22% of all data science professionals globally are female

Sources: WEF, Global Gender Gap Report and BCG research.

"Digital Skills for Life"

"For girls and young women to thrive in science, technology, engineering, (arts) and mathematics (STEM/STEAM) careers, they need to acquire skills to become both ICT users and creators in the digital world."

– Girls in ICT 2023

STEM/STEAM – Why relevant?

- Science, technology, engineering, arts, and mathematics

- STEM/STEAM education goes beyond school subjects.

- It helps us to solve the challenges the world faces today.

My goals today

- To share my personal journey and experiences as a woman in STEM,

- To inspire and encourage other girls and women to pursue their passion and potential in STEM fields.

Let's Break barriers!

My **journey** – Why I chose a STEM/STEAM career.

Pathways to my Career

Challenges **and lessons** learned

Opportunities for the career in CARICOM and wider world

Let's Chat! Q & A

Who Am I?

Dr. Letetia Addison

Ph.D. Mathematics,

M.Phil. Statistics,

B.Sc. Mathematics (Double, First Class Honours)

Project Officer/Statistician - the UWI, St. Augustine Campus

Lecturer - Mathematics and Statistics courses
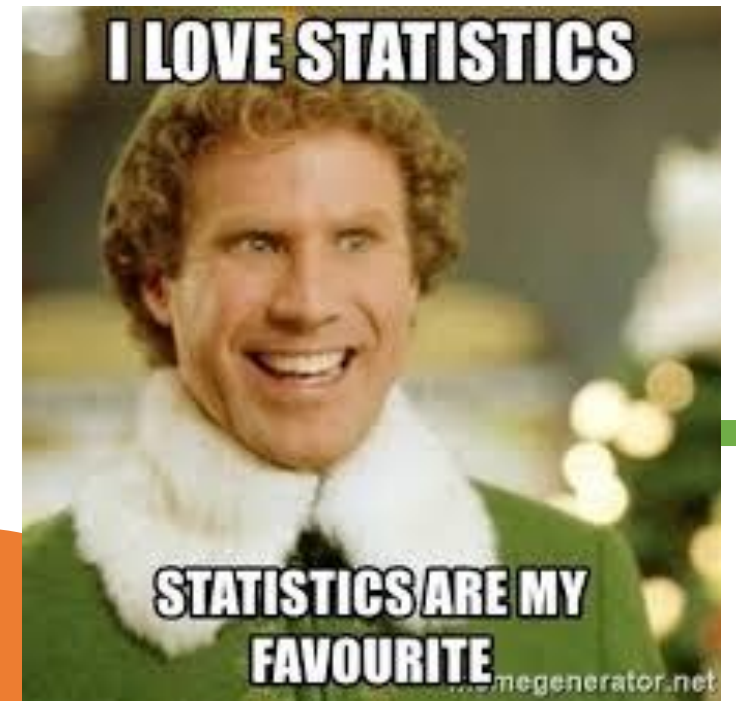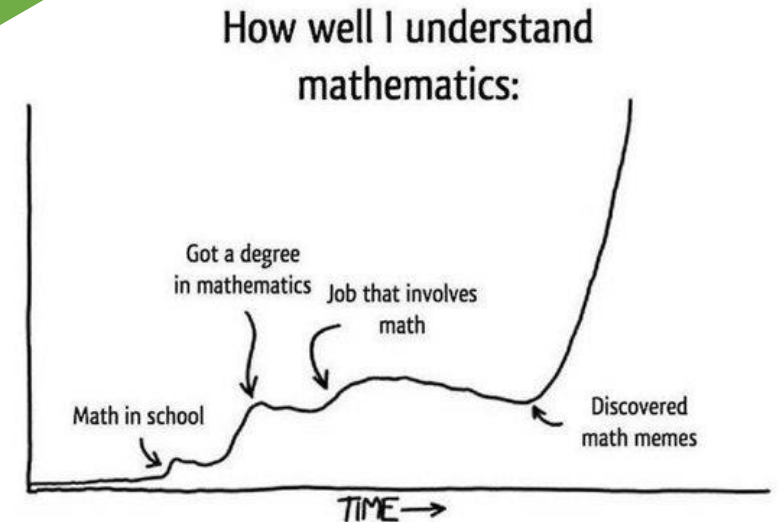
Women in Data Science (WiDS) Trinidad and Tobago Ambassador

Research Interests: Building Data-driven Models for climate change, education etc

Other interests: Reading, Health & Fitness, Makeup Artistry, Creating positive change in the world!

My Personal Journey:
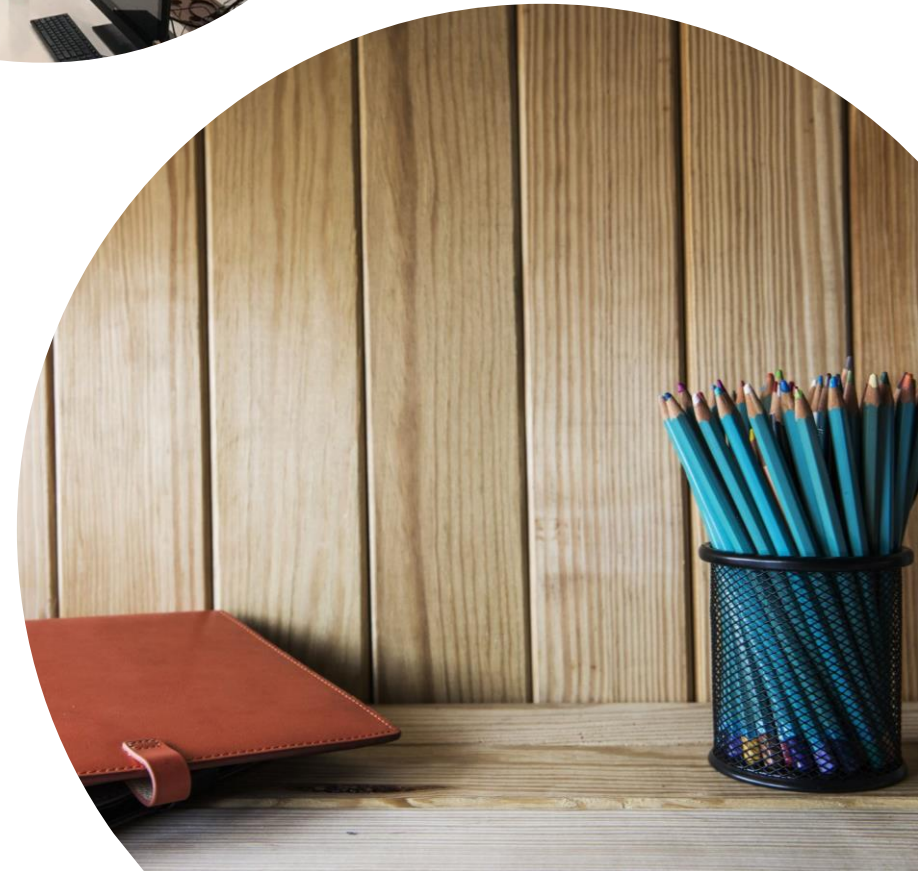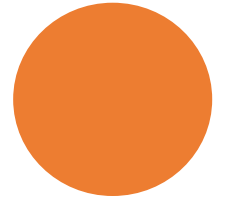## Childhood to Secondary Education

- I developed an interest and love for mathematics from an early age

- Role models and mentors supported and motivated me (parents, teachers, and peers).

- I pursued Math and Sciences in Secondary School (CXC and A Levels)

- I overcame the stereotypes and challenges as a girl who excelled in math (particularly at University level)

- I loved reading, a Spiderman movie fan, played table tennis and liked to knit :)

How well I understand mathematics:

Got a degree in mathematics

Job that involves math

Math in school

Discovered math memes

TIME →

I LOVE STATISTICS

STATISTICS ARE MY FAVOURITE

megenerator.net

Pathway to my Career

- **Undergraduate degree:**

- *Bachelor of Science in Mathematics (Double Major, First Class Honours) pursuing Maths, Stats and Computer courses*

- **Graduate degrees:**

- *Master of Philosophy in Statistics (Stats yay!);*

- *Doctorate (PhD) in Mathematics (More Math :);*

- *Postgraduate Certificate in University Teaching and Learning (I love teaching!)*

- **Lecturer for over a decade *in Mathematics and Statistics Courses* at the UWI:** *I was the Math Help Centre Coordinator and involved in Math Fairs and Outreach.*

- **Project Officer/Statistician:** *Since 2019 at University Office of Planning – Survey Analysis, Strategic Planning and Building Models :)*

- **Women in Data Science Ambassador for T&T:** *Mentoring, support and motivation for data science enthusiasts*

- **Other roles:** *Lead of several research projects and publications, ASA GivesBack Team, MindWISE Mental Health Statistics Advisor among others*
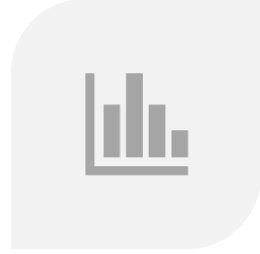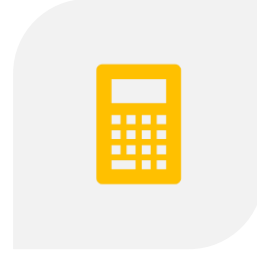
Life Snapshots :)

"Anything is possible for Him who believes" (Mark 9:23)
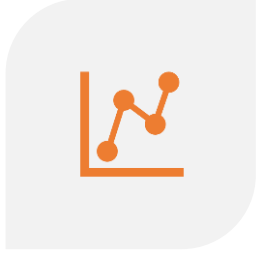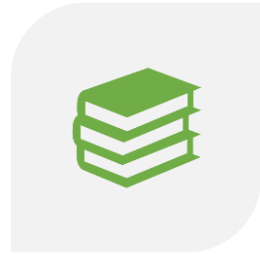
STATISTICS

DATA SCIENCE

MATHEMATICAL MODELLING

PROBABILITY MODELS

AI IN HIGHER EDUCATION
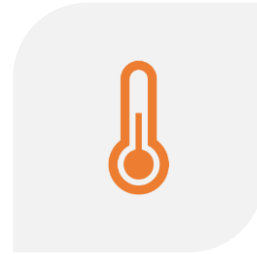
CLIMATE CHANGE

I apply my Knowledge in Various Fields involving Math & Stats :)

I use Data to tell a story!

DATA

SORTED

ARRANGED

PRESENTED VISUALLY

EXPLAINED WITH A STORY

ACTIONABLE (USEFUL)

STEM Applications: Data Science
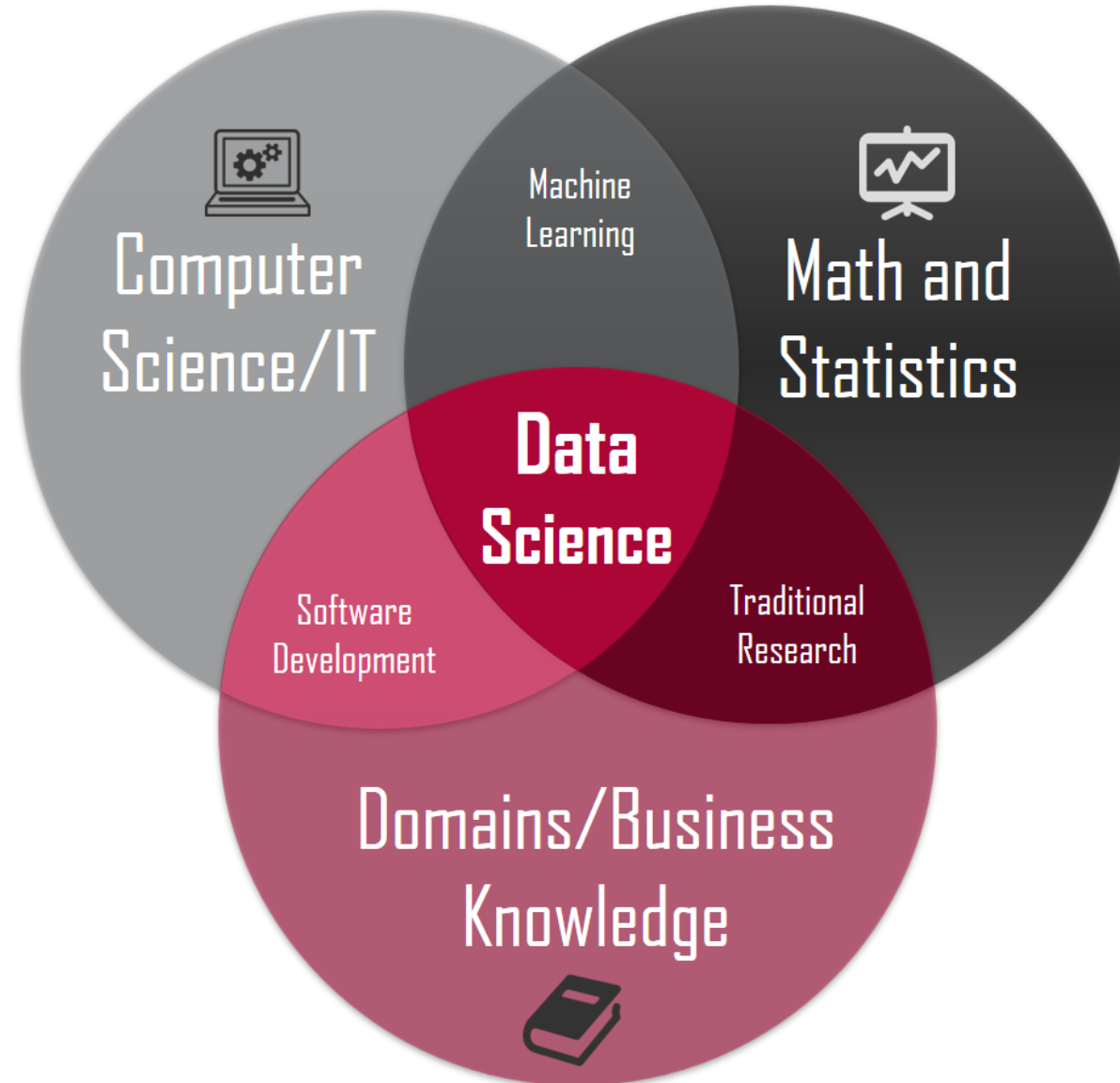
Insights can be used to guide decision making and strategic planning

How I make an impact?

Inspiration, education, community and support through local, regional and global networking and projects

STEM to the rescue!

Youth is more worried about climate change than the older generation.

- As statistics show, [70% of young people](#) aged 18 to 34 worry about global warming.
- STEM education can help to find necessary solutions for sustainable development.

A Model for Flood Risk

The GRD 2022 Climate Resilience Data Challenge involves the development of AI application prototypes on key climate data issues to provide deeper insights that can lead to improved policy formulation, decision making in the OECS/ECCU region.

Team From UWI Five Islands and St Augustine Campuses Win Growth and Resilience Dialogue Artificial Intelligence Data Challenge

- **Climate change** – using classification models to predict risk of natural disasters such as floods

- **My Team won first place in the GRD Climate Data Challenge 2022** ☺

- AI Prototype using OECS Climate Data variables such as temperature and precipitation, to predict flood risks in various countries.

Data Challenge for Climate Change

- Natural Disaster Risk: classifies the predicted risk of a natural disaster e.g. floods in OECS Countries
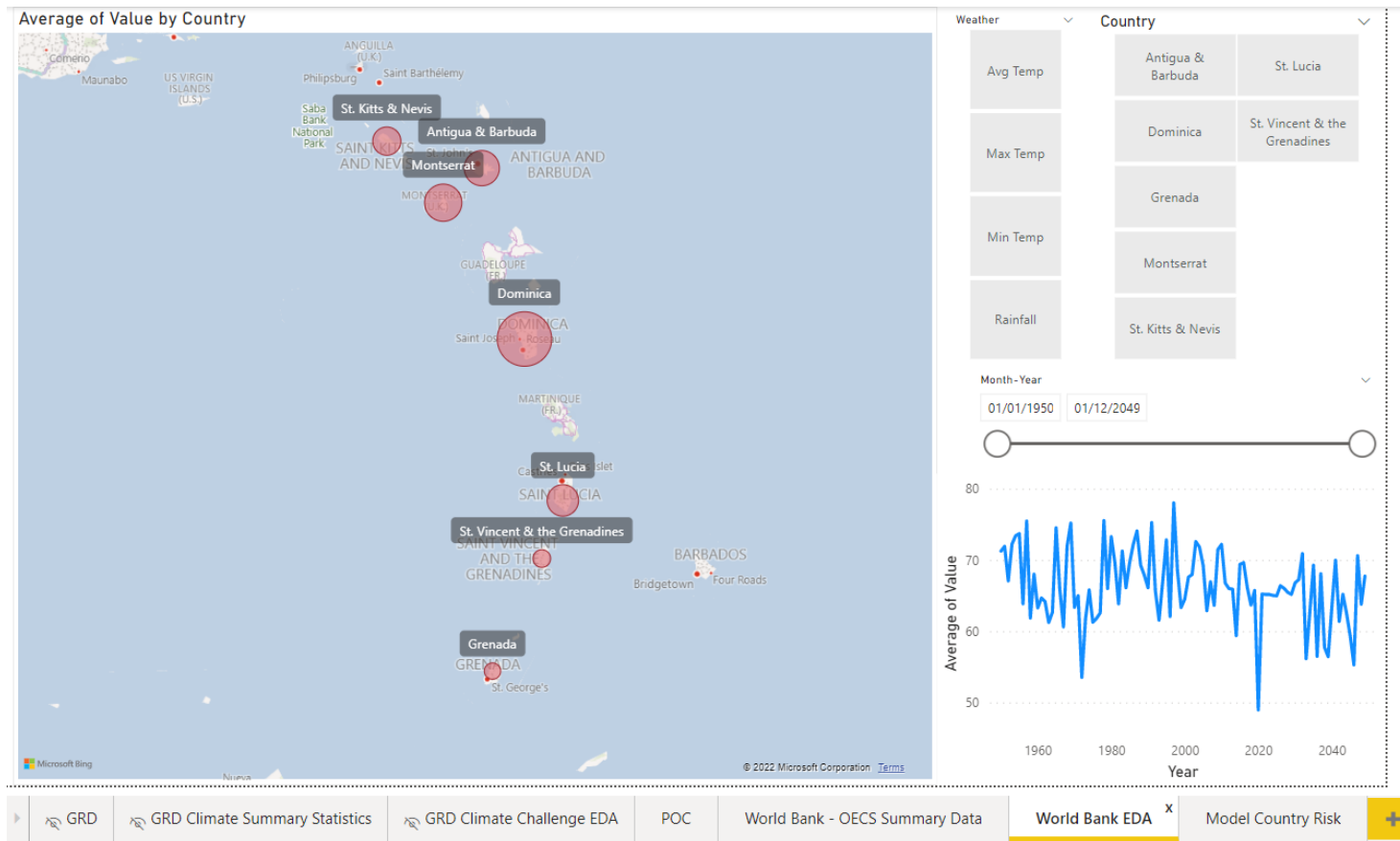
Snapshot: OECS Natural Disaster Risk Prototype

A model for Student Retention
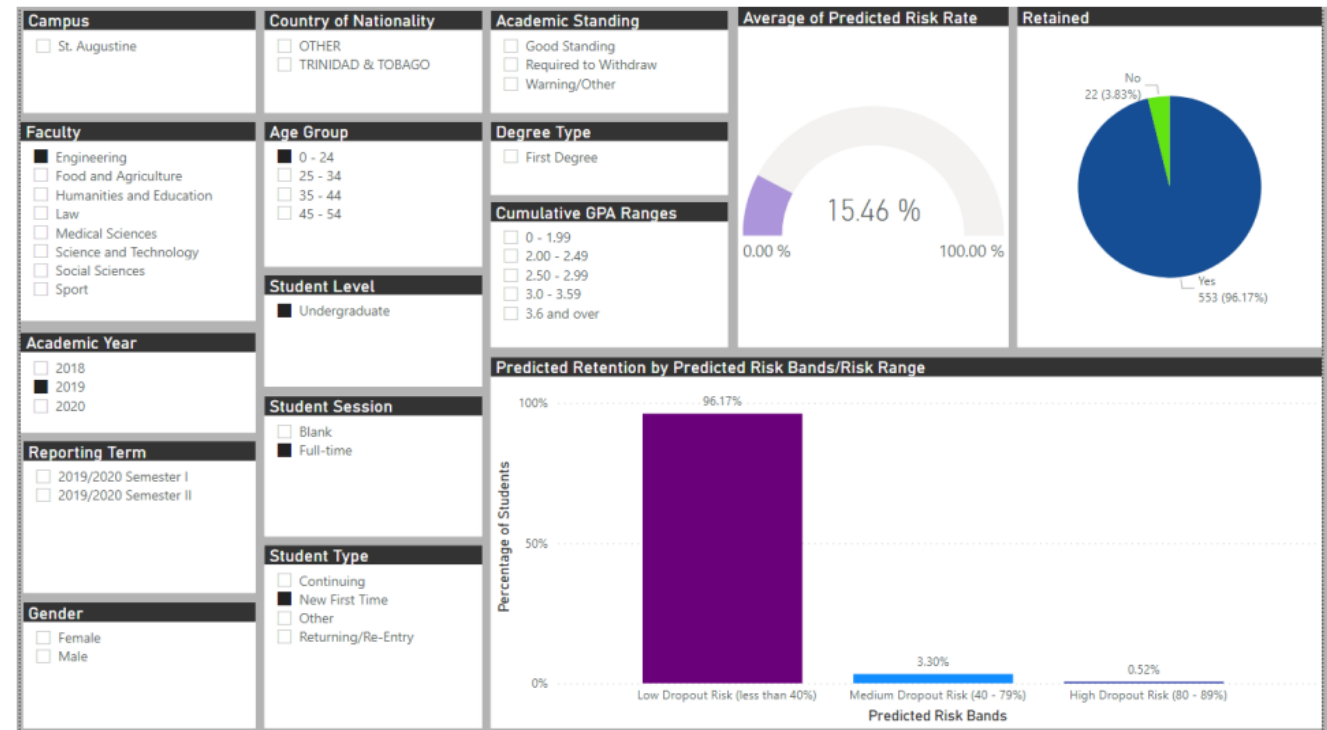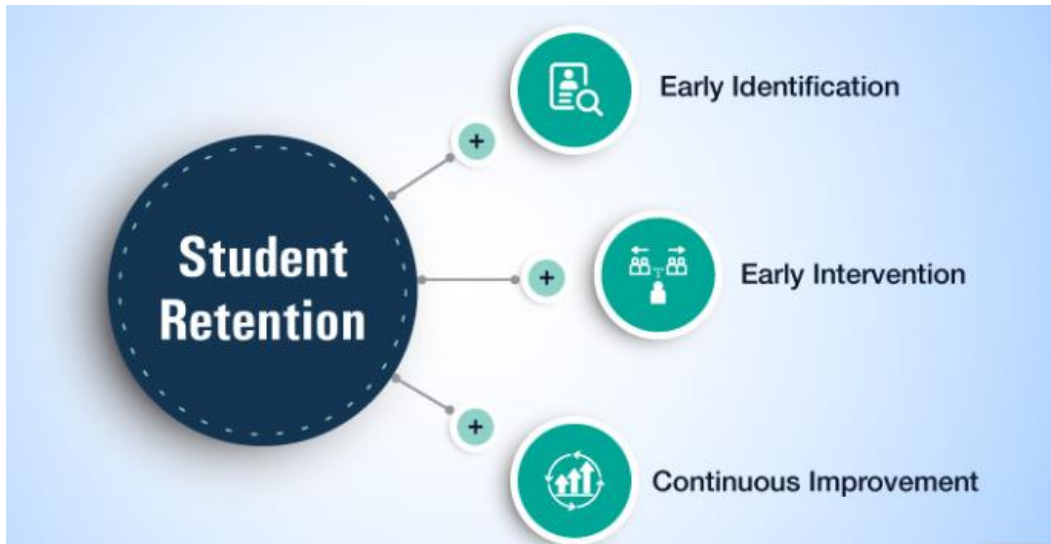
- I **built a model to predict the risk of student dropout** at the UWI based on different factors (Age, Gender, Faculty, GPA etc.)

Snapshot: Student Retention Prototype

Prey-predator Models applied to Investments

Predator
['pre-da-tar]

A slang term for a financially strong company that "gobbles up" another company via a merger or acquisition.

Investopedia

THE STARTUP ECOSYSTEM
PREDATOR VS PREY
WHAT IS YOUR NICHE?

There is a circle of life that makes the Tech Startup Ecosystem self-sustainable. We have put a magnifying glass up to each specimen to determine its role, predators, and prey. Take caution: this ecosystem rests in a delicate balance, for your viewing pleasure only.

VENTURE CAPITALIST

Scientific Name: Venturius Capitalias Richium

Role: To invest resources in promising startups to earn large returns when a company finally exits.
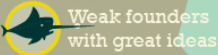
Ubiquitous — Endangered

Predators: Tech bloggers, Pompous founders **Prey:** Weak founders with great ideas

ANGEL INVESTOR

**Scientific Name:** Angelicus Investorius

Role: Invests money in businesses that are in need of extra capital.

Ubiquitous — Endangered

- In my PhD I applied biological Prey-Predator Models Applied to mimic the behaviour of Investor behaviours (e.g. Stock Market, Venture Capital etc.)

- It is uses mathematical models to show the changes over time based on human behaviour

Predator-Prey Interaction Model

A model for Electric Vehicle Charging
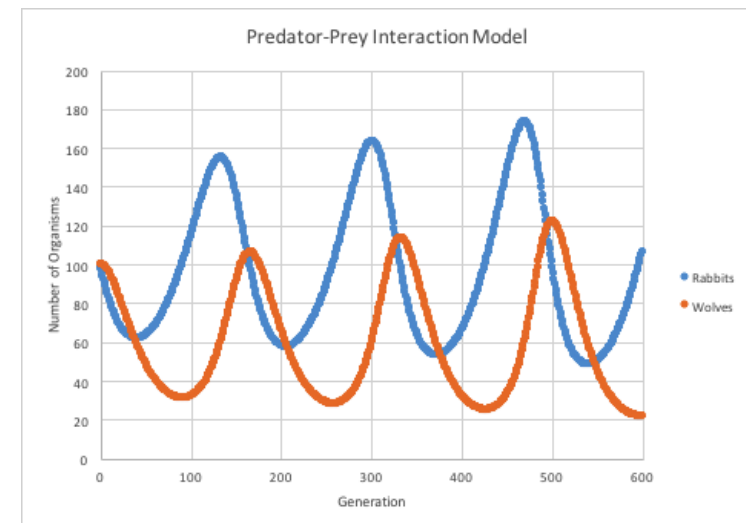
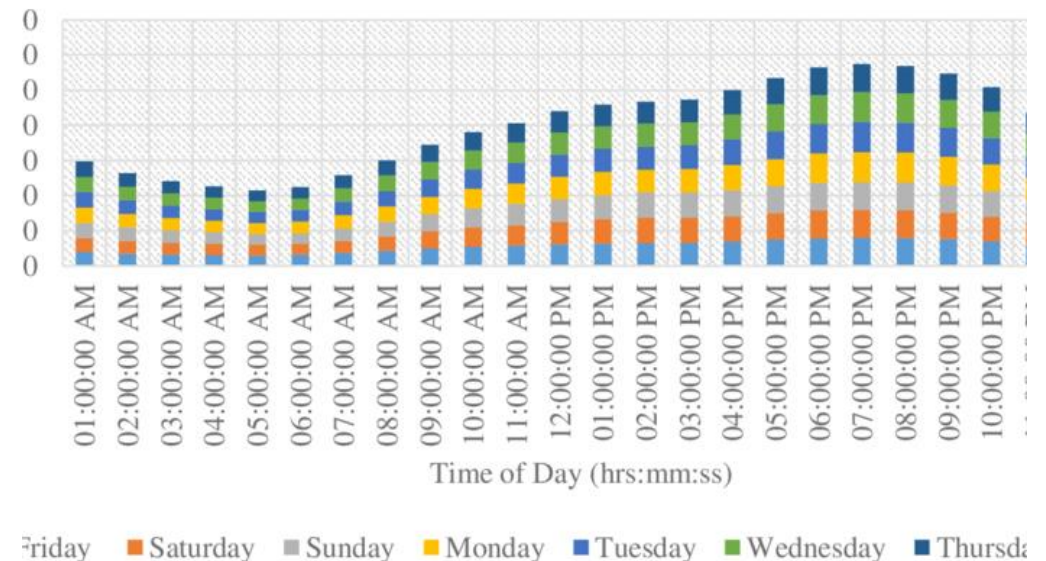**Electric vehicle charging behaviour**

- I collaborated with Electric Engineers at the UWI to compare the charging behaviour of persons using Electric Vehicles using simulated data from the U.S.

- This provided a means to understand the charging load based on how often persons charge vehicles for different days of the week

- Probability models provided a means to understand the patterns over time

See my Google Scholar page for more information:

https://scholar.google.com/citations?user=CzHc0WgAAAAJ&hl=en

Total Weekly Load (MW) classified by time of day

Time of Day (hrs:mm:ss)

Friday ■ Saturday ■ Sunday ■ Monday ■ Tuesday ■ Wednesday ■ Thursday

How did I succeed? Skills and Strengths

- Logical thinking,
- problem-solving,
- creativity,
- communication,
- Collaboration
- Mentorship
- Emotional Self-regulation

Challenges and Lessons Learnt

- Imposter Syndrome – Do I know enough?

- Lack of support or community - Not many females in this arena

- Gender bias – Can I excel in a male dominated field?

- Lack of resources/career opportunities – Will there be room for me in the arena?

- Balancing work and life – Burnout is not fun!

- **Developed emotional intelligence with Resilience, perseverance, self-confidence, and self-care in overcoming obstacles and achieving success.**

Breaking barriers in STEM/STEAM

- Promotes diversity and creativity.

- Solve real-world problems

- Inspire new forms of innovation and push the boundaries of what's possible.

- Creates a more inclusive and equitable society that values the contributions of all people.

Diversity and Inclusion in STEM

- **MATH IS FOR GIRLS** Math is not just for boys. It's for girls too! By encouraging girls to study Math, we can help break down gender barriers in STEM fields and create a more diverse and inclusive world. Girls can excel in Math and pursue any career they choose.

- **MATH IS FOR BOYS** Math is not just for girls. It's for boys too! By encouraging boys to study Math, we can help create a more equitable and diverse world. Boys can benefit from learning Math and pursuing careers in STEM fields

My advice for women and girls interested in STEM/STEAM-related fields?

- **Develop** your hard and soft skills

- **Pursue** online courses to upskill in your field (Coursera, EdX, Udemy etc.)

- **Get involved** in (online) communities, with supportive mentors in your field

- **Volunteer** and give service to others (e.g. tutoring in your subject area)

- **Be well-rounded** and balanced – Have a hobby, play a sport, improve your spiritual life!

- **Stay Humble and be a life-long learner** - there is always more to know :)

The Future is Bright!

"CARICOM girls join the ICT and STEM/STEAM revolution, and do you part to make our region and the world a better place."

Thank you for your time!

Questions?

Feel free to contact me via email: letetia.addison@sta.uwi.edu

Or connect with me on LinkedIN:
https://www.linkedin.com/in/letetia-addison/