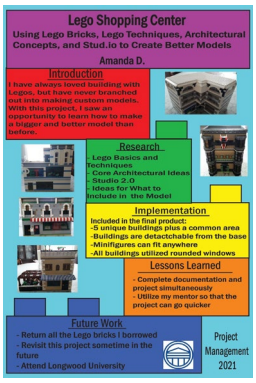
SENIOR CAPSTONE EXTRAVAGANZA

IT Project Management

Click the thumbnail to learn more about the project

Dear, Cultural Butterfly
Creating open dialogue to open minds
Madison A.

Nutrition & Insulin Resistance
A comprehensive Guide to the Condition and Management
Shruti B.



Lego Shopping Center
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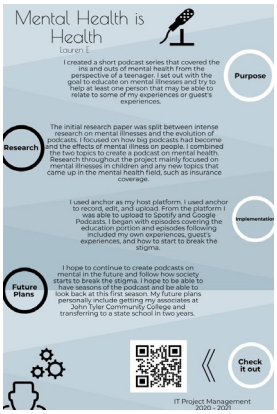
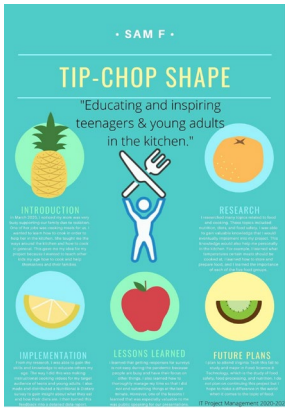
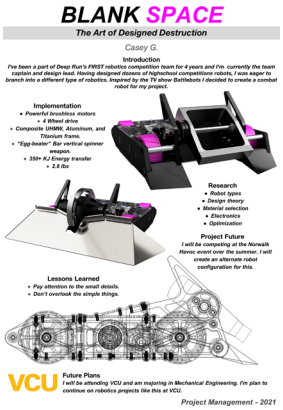


Mental Health is Health
Podcast series on mental health
Lauren E.



Tip-Chop Shape
Educating and inspiring teenagers & young adults in the kitchen
Sam F.



Blank Space
The Art of Designed Destruction
Casey G.

More Projects —>

IT Project Management

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Chinese Checkers AI

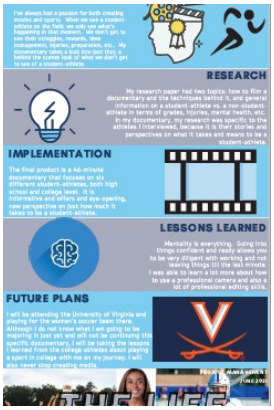
Creating an Artificial Intelligence that learns to play Chinese checkers

Hanyang L.

Traveling Tutoring Bus

Closing the Digital Divide

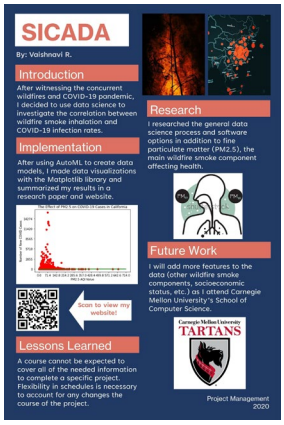
Erika L.



The Life of a Student Athlete

A deeper look into the successes, struggles, mentality, and physicality behind a student athlete

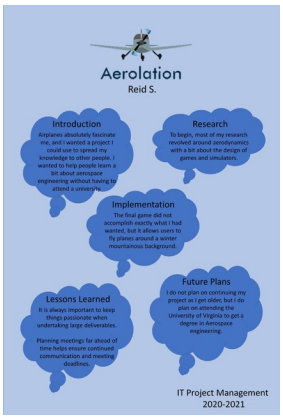
Camryn M.



Sicada

Correlation between wildfire smoke inhalation and COVID-19 infection rates

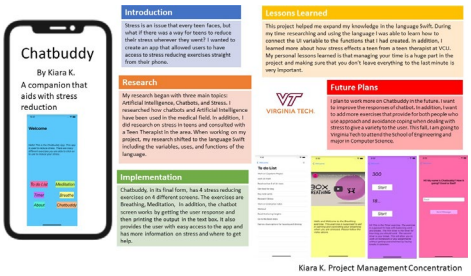
Vaishnavi R.



Aerolation

Learn a bit of information about aerospace

Reid S.



Chatbuddy

A companion that aids with stress reduction

Kiara K.

Feasting on Fusion

Chinese/Vietnamese Fusion Cookbook

Allie Q.

[<— Return to main page]

Dear, Cultural Butterfly

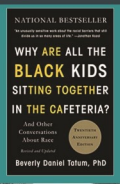
Creating open dialogue to open minds

Introduction

Project Scope
- 35 minute documentary on ethnic identity
- interviews with minority upperclassmen students & teachers
- Upload final film to YouTube

Inspiration
- Particpation in protests in 2020
- Dream to make my own film
- Promote Open Mindedness
- Leave a mark on DRHS

Research



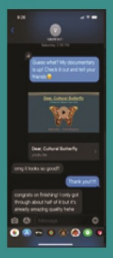
Racial/ Ethnic Concepts Researched
- Discrimination & Racism History
- Perspective of identity
- (Ethnic) Idenitity Definitions

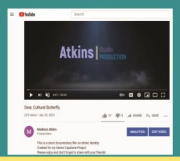
Videography Techniques Researched
- Best lighting
- Delivery of interview questions
- Avoid "talking head" stigma
- Participant Comfort

Madison A.

Implementation

Final Deliverables
- +6 Interview Questions
- Detailed Storyboard
- Upload film to YouTube
- +150 views
- Various Promotional Methods

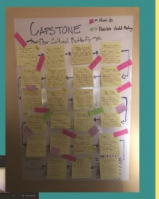


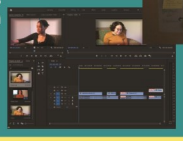


Lessons Learned

Personal Relizations
- Self Trust
- Patience
- Work Ethic
- Determination
- Believe In Myself More
- Keep Moving Forward

Academic Skills
- Videography Techniques
- Sense of Professionalism
- Scheduling Efficiently
- Flexibility





Future

For the Project
- Have a full professional screening of my film
- Keep sharing my film to others
- Probably won't continue things much further for the film itself

DREXEL UNIVERSITY College of Engineering

College
- Attend Drexel University this fall
- Major in Electrical Engineering
- Continue my activism
- Use my new found skilss as a hobby

SCAN ME

to watch the final film

2021 IT PM

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Nutrition & Insulin Resistance

A Comprehensive Guide to the Condition and Management

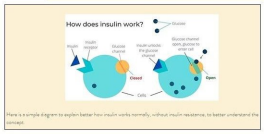
By Shruti B

Introduction

- 1/3 of the US population has insulin resistance
- Have seen the effects of the condition firsthand
- Wanted to make an accessible product to **educate** about insulin resistance management and nutrition

Research

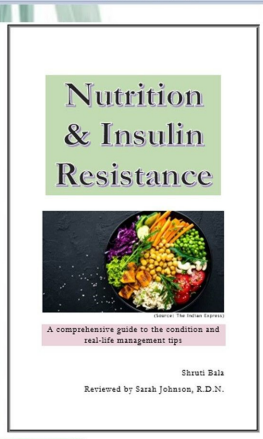
- My entire project is research-based
- Topics- basic nutrition, nutrition specific to insulin resistance, effects of sleep, stress, and exercise on insulin resistance
- Peer-reviewed scientific studies



Google Scholar

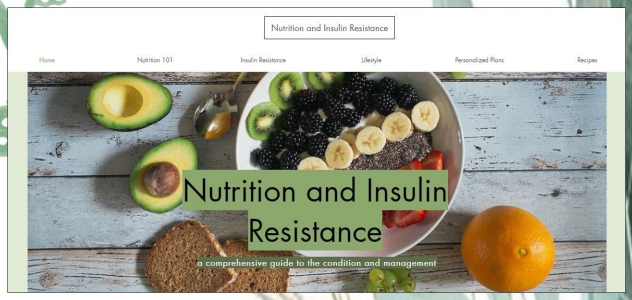
Implementation

- Written guide/e-book that was 88 pages long and with 9 chapters
- Website with the same information as well as interactive tools



Lessons Learned

- It's not embarrassing to ask questions
- Planning is key- write everything down
- Make realistic schedules and don't get demotivated



Future

- Sending website to a doctor's office to possibly be shared with patients with insulin resistance
- Attending UVA next year in the School of Engineering with Computer Science as my prospective major

University of Virginia School of Engineering

IT Project Management 2021

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Lego Shopping Center

Using Lego Bricks, Lego Techniques, Architectural Concepts, and Stud.io to Create Better Models

Amanda D.

Introduction

I have always loved building with Legos, but have never branched out into making custom models. With this project, I saw an opportunity to learn how to make a bigger and better model than before.

Research

- Lego Basics and Techniques
- Core Architectural Ideas
- Studio 2.0
- Ideas for What to Include in the Model

Implementation

Included in the final product:
-5 unique buildings plus a common area
-Buildings are detactchable from the base
-Minifigures can fit anywhere
-All buildings utilized rounded windows

Lessons Learned

- Complete documentation and project simultaneously
- Utilize my mentor so that the project can go quicker

Future Work

- Return all the Lego bricks I borrowed
- Revisit this project sometime in the future
- Attend Longwood University

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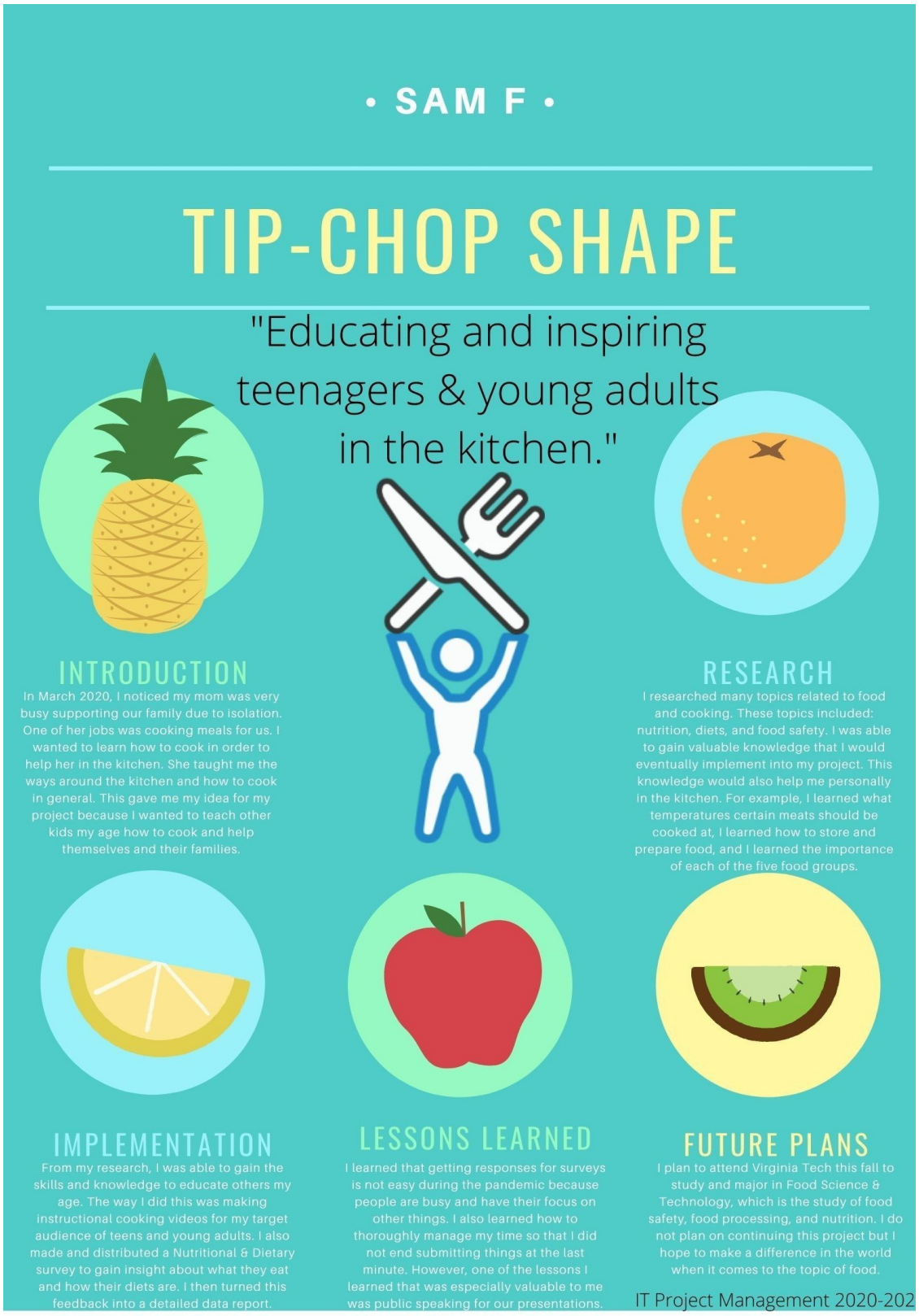

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BLANK SPACE

The Art of Designed Destruction

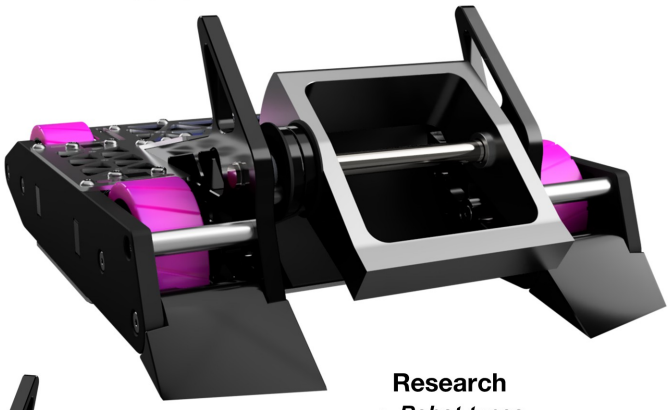
Casey G.

Introduction

I've been a part of Deep Run's FIRST robotics competition team for 4 years and I'm currently the team captain and design lead. Having designed dozens of highschool competitions robots, I was eager to branch into a different type of robotics. Inspired by the TV show Battlebots I decided to create a combat robot for my project.

Implementation

- ***Powerful brushless motors***
- ***4 Wheel drive***
- ***Composite UHMW, Aluminum, and Titanium frame.***
- ***"Egg-beater" Bar vertical spinner weapon.***
- ***350+ KJ Energy transfer***
- ***2.8 lbs***



Research

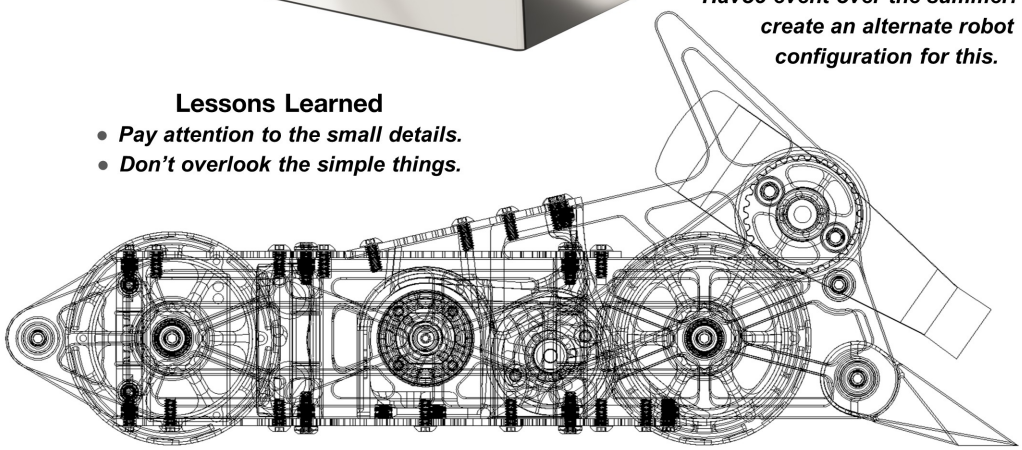
- ***Robot types***
- ***Design theory***
- ***Material selection***
- ***Electronics***
- ***Optimization***

Project Future

I will be competing at the Norwalk Havoc event over the summer. I will create an alternate robot configuration for this.

Lessons Learned

- ***Pay attention to the small details.***
- ***Don't overlook the simple things.***



Future Plans

I will be attending VCU and am majoring in Mechanical Engineering. I'm plan to continue on robotics projects like this at VCU.

Project Management - 2021

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Creating an Artificial Intelligence that learns to play Chinese checkers

Hanyang L.

Introduction

The goal of the project is to create an artificial intelligence agent capable of playing Chinese checkers.

Implementation

The project included several other components to accomplish this main goal. A Chinese checkers environment was programmed to host the training of the agent. A simplistic AI agent, a greedy action agent, was programmed to play against the reinforcement learning agent during training. This paper contains an evaluation of the results and the capability of the aforementioned agents and components. The agents will be tested against each other as well as a restricted random move generator to gauge success.

Research

DFS and BFS

Depth Field Search and Breadth First Search are both search algorithms for graphs.

Reinforcement Learning

Broken down to the simplest terms, reinforcement learning consists of an environment, an agent, states, and rewards.

Exploration-Exploitation Dilemma

Applies to the agents in reinforcement learning training. On occasion allow agent to make seemingly "stupid" moves (random) moves that could turn out being positive and beneficial. This would provide an opportunity to learn.

Q-learning

In q-learning, neural nets takes in action state pairs and transforms it into one value, q-value. In the context of my project, it is taking in a visualization of different states of a board and generating an associated q-value based upon it.

Lessons Learned

- DFS and BFS
- Reinforcement Learning
- Neural Nets
- DL4J

Future Plans

- Android app
- Improved greedy action agent
- UVA

IT Project Management, 2021

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Traveling

TUTORING BUS

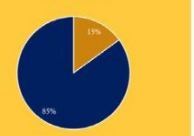
Closing the Digital Divide

Introduction

In Henrico County alone, about 15% of students cannot easily access the Internet. My project aimed to provide resources for these students by presenting a complete formal proposal (with budget) to the School Board with information to make a traveling tutoring bus with computers, tutors, and Internet access.

RESEARCH

-Digital divide
-Ways to combat its impact
- mobile groups
- tutoring
- repurposing older technology



IMPLEMENTATION

Final Deliverables:
- formal proposal
- sample schedule
- complete budget
- present to HCPS School Board

Total Additional Equipment:	17,125
Total General Modifications:	20,288
Grand Total:	37,413

LESSONS LEARNED

- Inner workings of Henrico County
- Campaigning myself/my idea
- Public speaking
- Communication

FUTURE WORK

No further project work.
Next year:
- The Ohio State University
- Civil Engineering

BY ERIKA L.

IT Project Management 2021

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THE LIFE OF A STUDENT-ATHLETE

A deeper look into the successes, struggles, mentality, and physicality behind a student athlete

Camryn M

INTRODUCTION

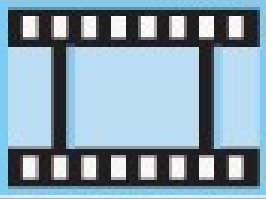
I've always had a passion for both creating movies and sports. When we see a student-athlete on the field, we only see what's happening in that moment. We don't get to see their struggles, rewards, time management, injuries, preparation, etc.. My documentary takes a look into just that, a behind the scenes look of what we don't get to see of a student-athlete.

RESEARCH

My research paper had two topics: how to film a documentary and the techniques behind it, and general information on a student-athlete vs. a non-student-athlete in terms of grades, injuries, mental health, etc. In my documentary, my research was specific to the athletes I interviewed, because it is their stories and perspectives on what it takes and means to be a student-athlete.

IMPLEMENTATION

The final product is a 46-minute documentary that focuses on six different student-athletes, both high school and college level. It is informative and offers and eye-opening, new perspective on just how much it takes to be a student-athlete.



LESSONS LEARNED

Mentality is everything. Going into things confident and ready allows you to be very diligent with working and not leaving things till the last minute. I was able to learn a lot more about how to use a professional camera and also a lot of professional editing skills.

FUTURE PLANS

I will be attending the University of Virginia and playing for the women's soccer team there. Although I do not know what I am going to be majoring in just yet and will not be continuing this specific documentary, I will be taking the lessons I learned from the college athletes about playing a sport in college with me on my journey. I will also never stop creating media.

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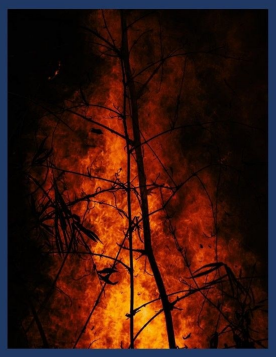
SICADA

By: Vaishnavi R.

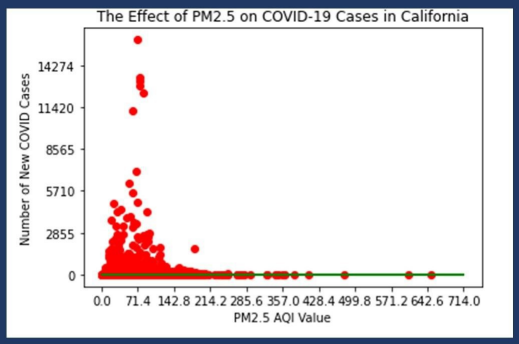


Introduction

After witnessing the concurrent wildfires and COVID-19 pandemic, I decided to use data science to investigate the correlation between wildfire smoke inhalation and COVID-19 infection rates.

Implementation

After using AutoML to create data models, I made data visualizations with the Matplotlib library and summarized my results in a research paper and website.



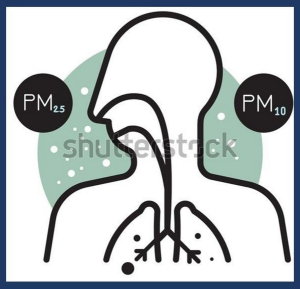
Scan to view my website!

Lessons Learned

A course cannot be expected to cover all of the needed information to complete a specific project. Flexibility in schedules is necessary to account for any changes the course of the project.

Research

I researched the general data science process and software options in addition to fine particulate matter (PM2.5), the main wildfire smoke component affecting health.



Future Work

I will add more features to the data (other wildfire smoke components, socioeconomic status, etc.) as I attend Carnegie Mellon University's School of Computer Science.

Carnegie Mellon University
TARTANS

Project Management
2020

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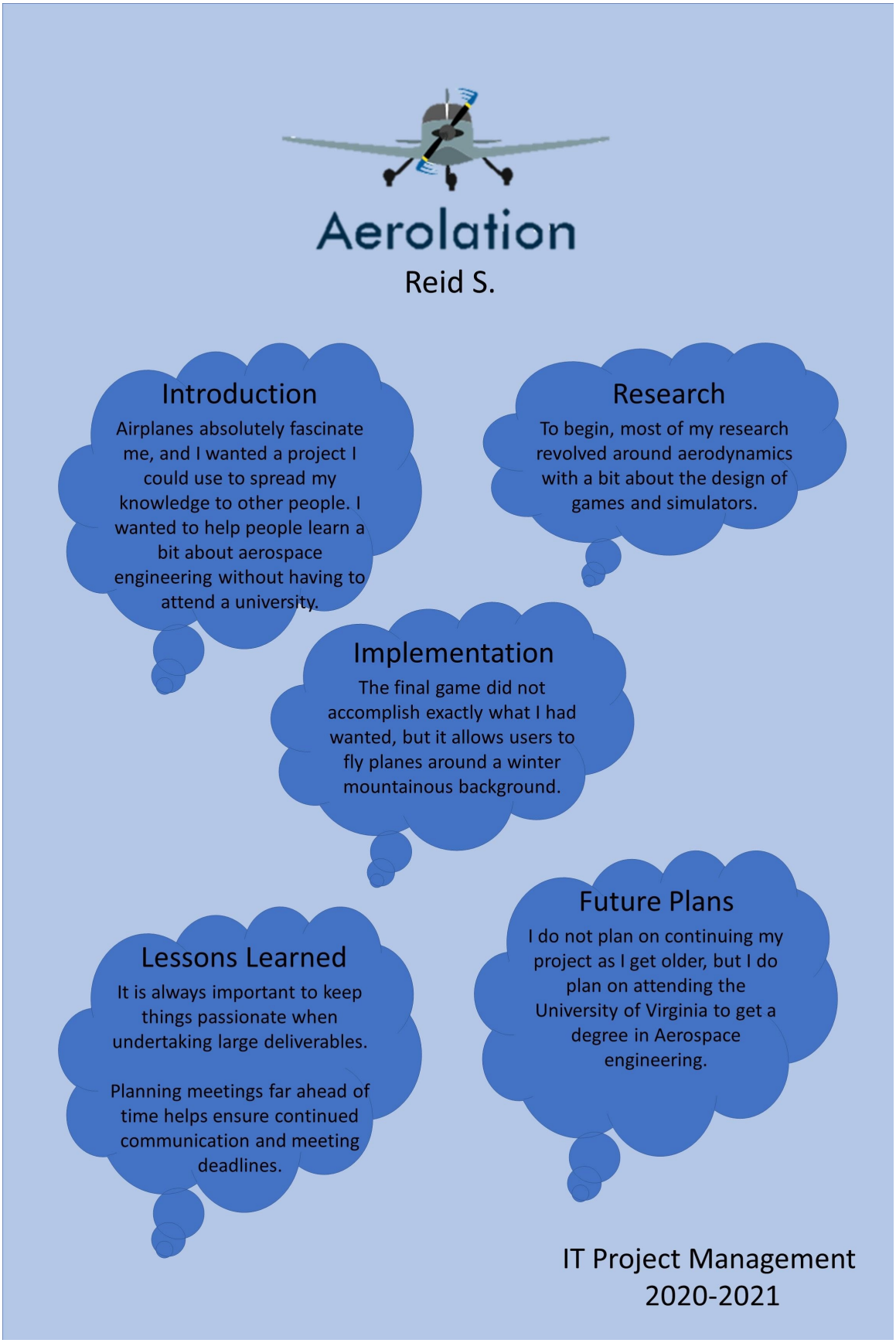

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Introduction

Stress is an issue that every teen faces, but what if there was a way for teens to reduce their stress wherever they went? I wanted to create an app that allowed users to have access to stress reducing exercises straight from their phone.

Research

My research began with three main topics: Artificial Intelligence, Chatbots, and Stress. I researched how chatbots and Artificial Intelligence have been used in the medical field. In addition, I did research on stress in teens and consulted with a Teen Therapist in the area. When working on my project, my research shifted to the language Swift including the variables, uses, and functions of the language.

Implementation

Chatbuddy, in its final form, has 4 stress reducing exercises on 4 different screens. The exercises are Breathing, Meditation, In addition, the chatbot screen works by getting the user response and then printing the output in the text box. It also provides the user with easy access to the app and has more information on stress and where to get help.

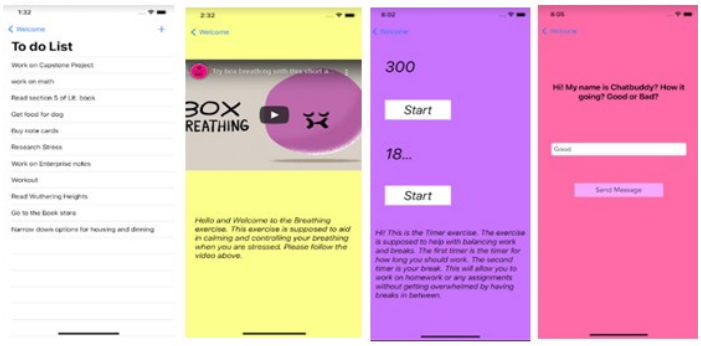
Lessons Learned

This project helped me expand my knowledge in the language Swift. During my time researching and using the language I was able to learn how to connect the UI variable to the functions that I had created. In addition, I learned more about how stress effects a teen from a teen therapist at VCU. My personal lessons learned is that managing your time is a huge part in the project and making sure that you don't leave everything to the last minute is very important.

VIRGINIA TECH

Future Plans

I plan to work more on Chatbuddy in the future. I want to improve the responses of chatbot. In addition, I want to add more exercises that provide for both people who use approach and avoidance coping when dealing with stress to give a variety to the user. This fall, I am going to Virginia Tech to attend the School of Engineering and major in Computer Science.



Kiara K. Project Management Concentration

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Chinese/Vietnamese Fusion Cookbook

Allie Q

Introduction

My project focuses on combining home recipes from both Chinese cuisine and Vietnamese Cuisine. This collection of recipes and ingredients bring the taste of my culture to your table!

Lessons Learned

I better my video editing skills and filming skills. This project taught me the importance of timeliness and scheduling.

Future Work

I will continue to cook and create videos to upload to my youtube channel.
In respects to my personal life, I will be attending Virginia Tech College of Engineering this fall.

My Research

- Chinese Cuisine
- Traditional Chinese Medicine
- Vietnamese Cuisine

Implementation

The finished product contains 25 instructional videos that walk the watcher through the process of cooking each recipe.
It also includes a cookbook with images and Directions. The cookbook also has an extensive glossary located in the back that covers uncommon terms and ingredients.

Feasting on Fusion

IT Project Management
Class of 2021

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