SAND2018-7715PE

Final Outbrief - MAC

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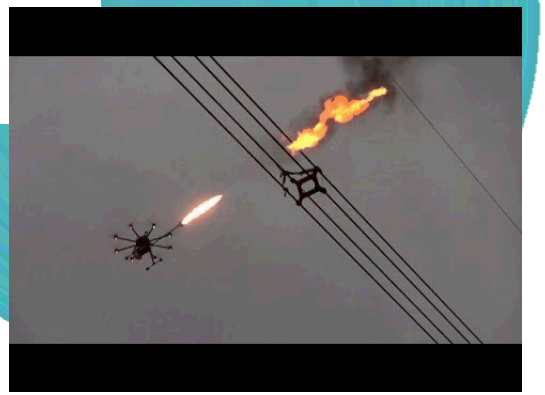
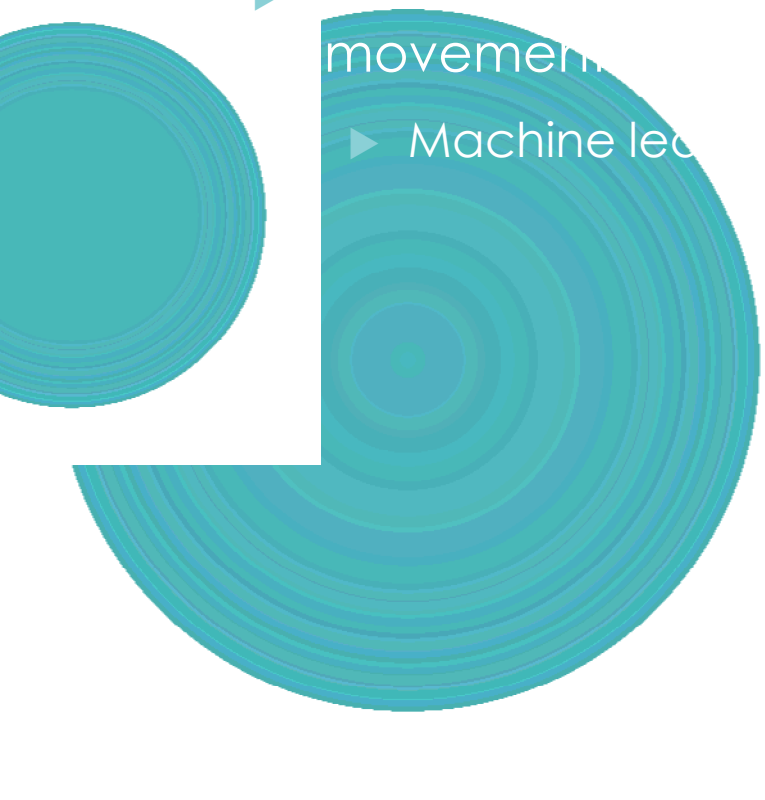
Background

- Drones and other unmanned aircraft have increasingly become popular in the recent years.
- Research and development in unmanned aircraft will increase and continue to be an important in the civilian and military world.



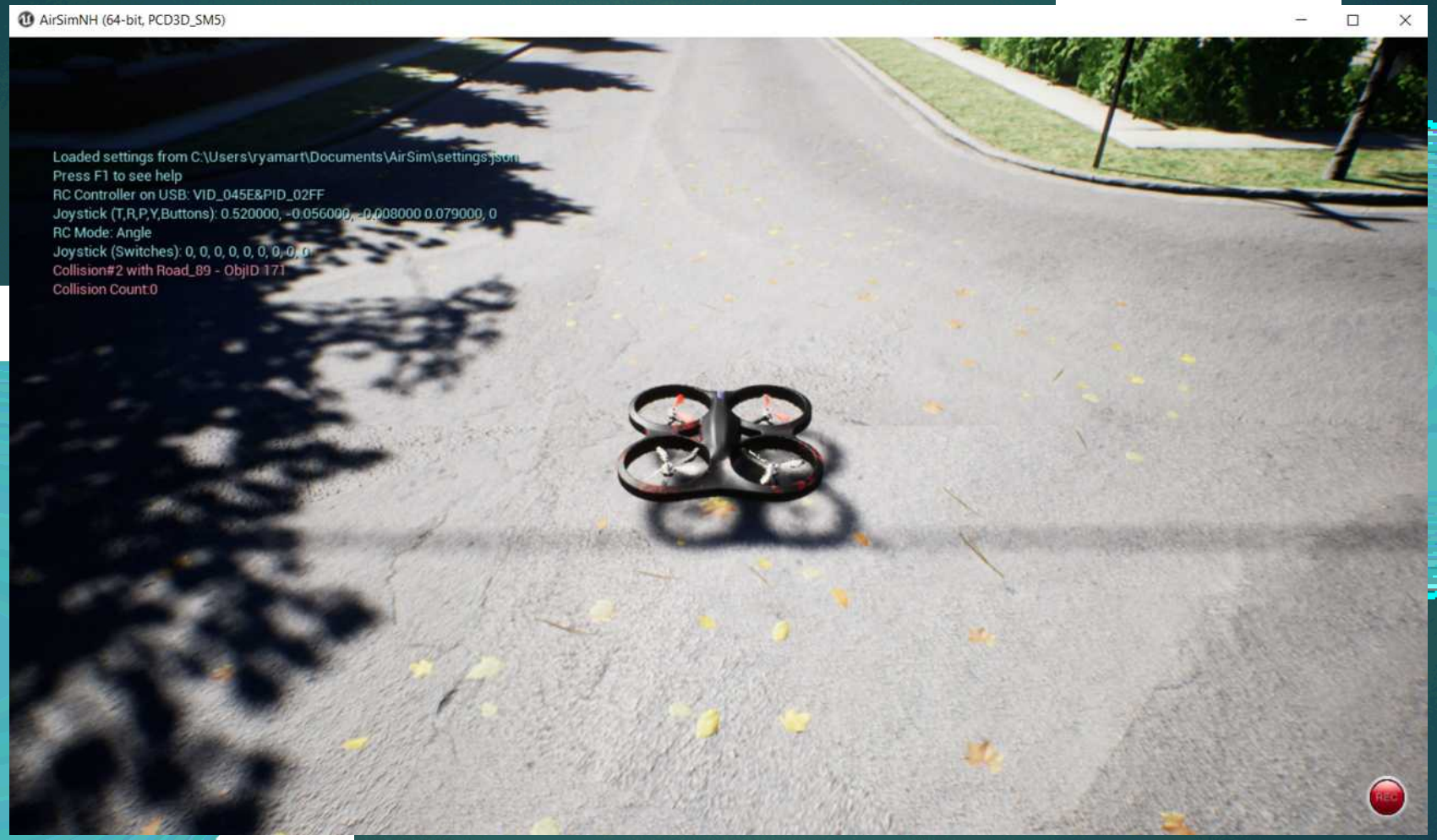
Purpose

- Find a drone simulator and get useful information such as drone positioning and coordinates.
- nize the drone's movements and future movemen
  - Machine lea



Finding a Drone Simulator

- AeroSim – RC
  - Very Realistic
  - Numerous types of drones and aircraft
  -
  - neSimPro
  - Some different
  - Allows API
  - rosoft AirSim
  - Free
  - One Drone
  - Allows API and R s information easiest


AirSimNH (64-bit, PCD3D_SM5)
Loaded settings from C:\Users\ryamart\Documents\AirSim\settings.json
Press F1 to see help
RC Controller on USB: VID_045E&PID_02FF
Joystick (T,R,P,Y,Buttons): 0.520000, -0.056000, -0.008000 0.079000, 0
RC Mode: Angle
Joystick (Switches): 0, 0, 0, 0, 0, 0, 0, 0, 0
Collision#2 with Road_89 - ObjID 171
Collision Count:0
REC

Output of Microsoft AirSim

C:\Users\ryamart\.spyder-py3\up.txt - Notepad++

File Edit Search View Encoding Language Settings Tools Macro Run Plugins Window ?

up.txt

Timestamp	Position(x)	Position(y)	Position(z)	Orientation(w)	Orientation(x)	Orientation(y)	Orientation(z)	ImageName
1528388807048	-130.217422	16.453136	-0.172753	0.994481	0.000000	0.000000	0.104919	img_0_0_1528388807947742800.png
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1528388809541	-129.961121	15.974369	-2.592707	0.978066	-0.019547	-0.008870	0.207187	img_0_0_1528388810552078200.png
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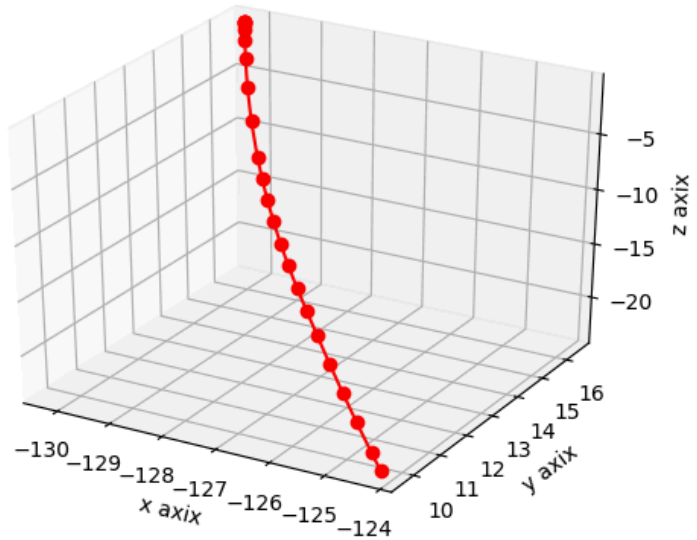
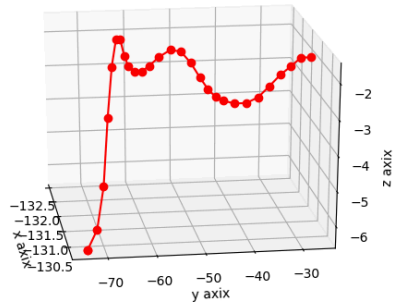
Output – Code and Graphs

temp.py | FINAL CODE.py | practice.py

```
# -*- coding: utf-8 -*-
"""
Spyder Editor

This is a temporary script file.
"""

from mpl_toolkits.mplot3d import Axes3D
import matplotlib.pyplot as plt
import numpy as np
fig = plt.figure()
ax = fig.add_subplot(111, projection="3d")

"""x,y,z = np.loadtxt('up_rec.txt', delimiter='\t', unpack=True)"""
A = np.loadtxt('up.txt', delimiter='\t', unpack=True, skiprows=1, usecols=(0,1,2,3,4,5,6,7))
x = A[1]
y = A[2]
z = A[3]

ax.plot(x, y, z, c='r', marker='o')

ax.set_xlabel('x axix')
ax.set_ylabel('y axix')
ax.set_zlabel('z axix')

plt.show()
```



Graphs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y axix
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−131.5
−131.0
−130.5
−70
−60
−50
−40
−30
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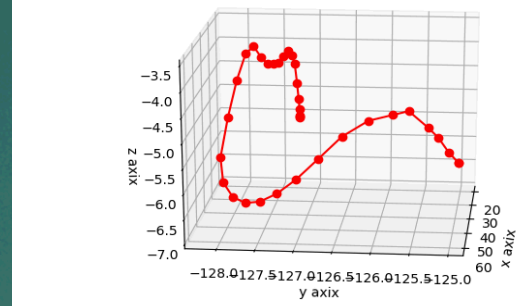
−3
−4
−5
−6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y axix
x axix
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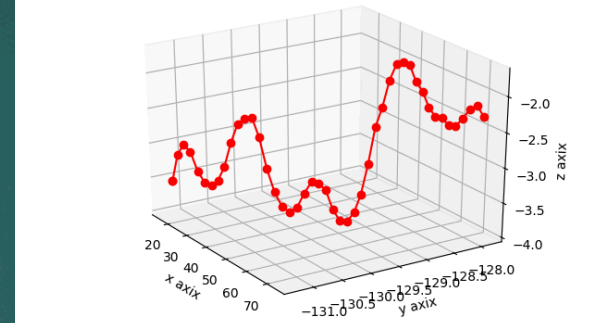
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x axix
y axix
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60
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−129.5
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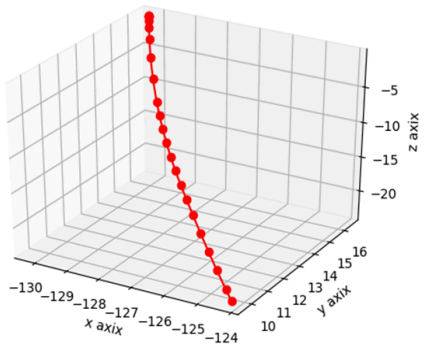
−128.5
−128.0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10
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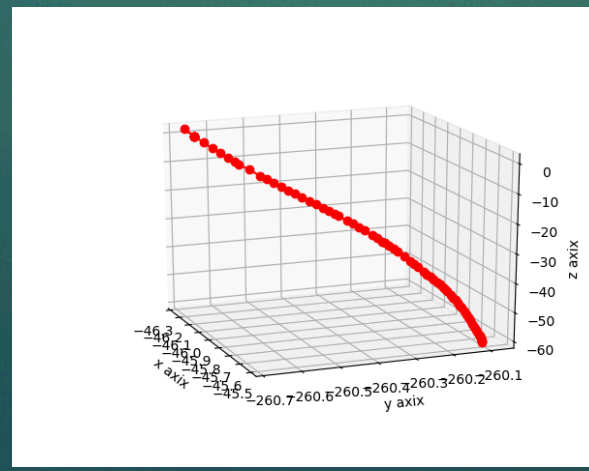
15
16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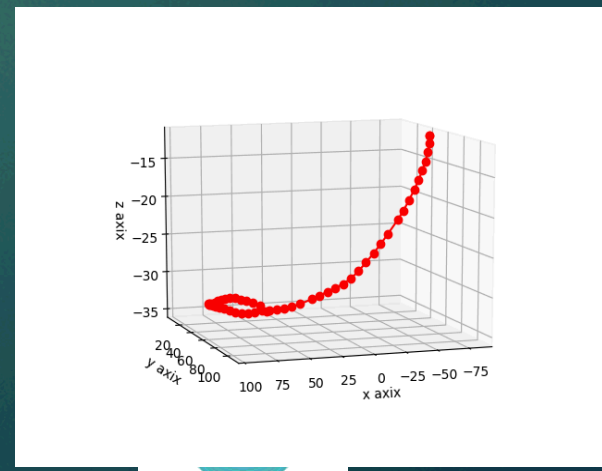
z axix
y axix
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80
100
100
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50
25
0
−25
−50
−75

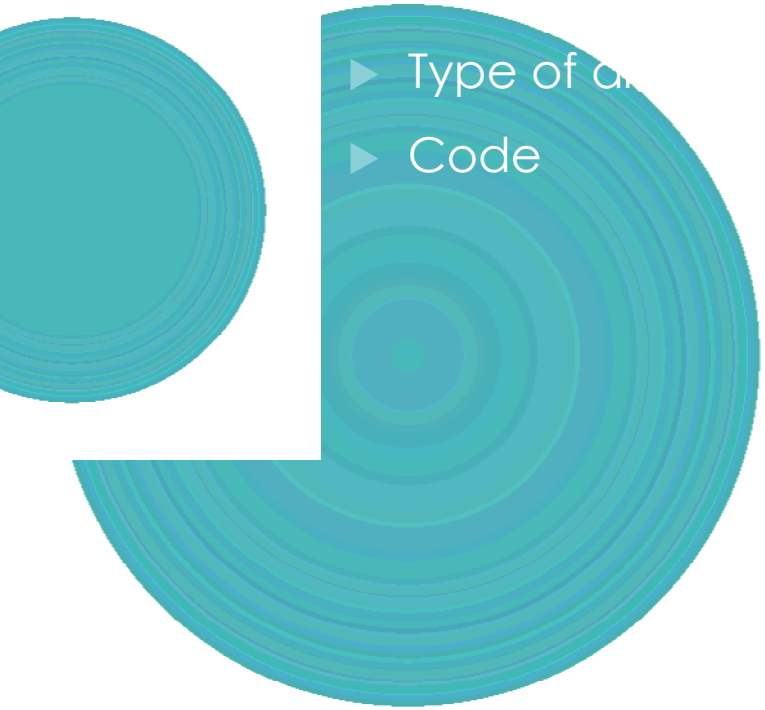
Problems

- Downloading the material
  - Anaconda
  - [illegible]
- Python
- Learning how to maneuver the drone in the simulator

Going Further

- Need a bigger range of data
- Machine learning can allow the computer to quickly recognize the

- Type of a
- Code



Lessons Learned

- Being at Sandia National Labs has opened my eyes to the vast ranges of research and the high level thinkers that work here.
- earn in a classroom to another level
- Time