Synthetic Data Pipeline for Pose Estimation (Milestone 3)

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Overview of Milestone 3

- Implement movement based on mathematical functions
- Add compatibility between operating systems
- Improving configuration file
- Putting pose information into coco dataset format

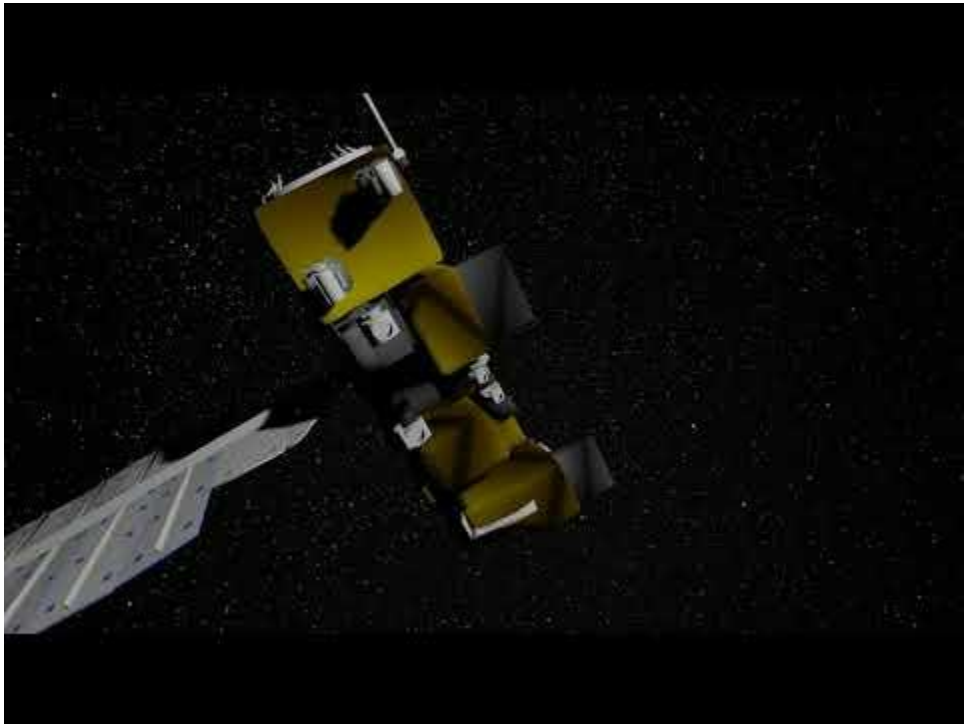
Milestone 3 Matrix

Task	William	Nate	Stephane	Hanibal	To Do
1. Complex movement along path	5%	0%	90%	5%	
2. Enable movement interaction through configuration file	100%	0%	0%	0%	
3. Implement compatibility among os	0%	66%	0%	0%	Add linux compatibility
4. Extract poses as coco type annotations	0%	0%	0%	100%	

Configuration File

```
[lighting]
light_type = "POINT"
location = [10, -10, 10]
energy = 10000

[camera]
location = [0.0, -6.5, 0.0]
rotation = [1.5, 0.0, 0.0]
lens = 20

[satellite]
satellite_file= "/models/nasa-aqua-satellite-obj/nasa-aqua-satellite.obj"

[background]
background_file= "/code/space.jpg"

[flightpath]
flight_path_type = "FUNCTION" #
positions = [[-10,0,0],[10,6,1]]
rotations = [[0,0,0],[0.8,2.4,1.5]]
y_eq = "2*x**2"
z_eq = "0*x**2"

[animation]
animation_lenth = 10 # In seconds
file_format = "JPEG"
output_dir = "E:/tmp/"
```

Demo Video



COCO Dataset format

- The COCO dataset is a well know dataset in machine learning
- By putting our dataset into COCO format it makes it easy for existing libraries to read in the data.


```
[{"Frame": 0, "Image": "E:/tmp/0", "Pose_info": [1.0, 0.0, 0.0, 0.0]}, {"Frame": 1, "Image": "E:/tmp/1",
"Pose_info": [1.0, 2.094696719723288e-05, 6.284913251874968e-05, 3.927887519239448e-05]}, {"Frame": 2, "Image":
"E:/tmp/2", "Pose_info": [1.0, 8.35240789456293e-05, 0.00025070318952202797, 0.00015666033141314983]}, {"Frame":
3, "Image": "E:/tmp/3", "Pose_info": [0.9999997615814209, 0.0001872923457995057, 0.0005625361809507012, 0.
```

Milestone 4 Goals

- Make x, y, z based on t instead of x
- Implement compatibility with Linux
- Test and create demos for each addition individually
- Expand use of configuration file
- Output position information in COCO dataset format

Milestone 3 Matrix

Task	William	Nate	Stephane	Hanibal
1. Meet with other satellite work team to discuss improvement	demo	demo	Participate	test
2. Implement compatibility on linux	demo	dev	Test	test
3. Refactor code to make future improvements easier and create simple user guide	Dev	Test	Dev	test
4. Add another function for flightpath in TOML file so we can support non-linear changes in x.	Dev	Test	Test	demo

Questions?