

Drone Spoof Detector



Team Members

- Leah Casey
- Samuel Gross
- Logan Parker
- Ashley Vanaman
- Michaela Walker



Client Information

- Chris
- Michael
- Gary

Mentor Feedback Mid-Iteration

- Believed our iteration 2 features sounded good.
- Glad we had a plan on how to proceed regarding the code.

Mentor Feedback End of Iteration

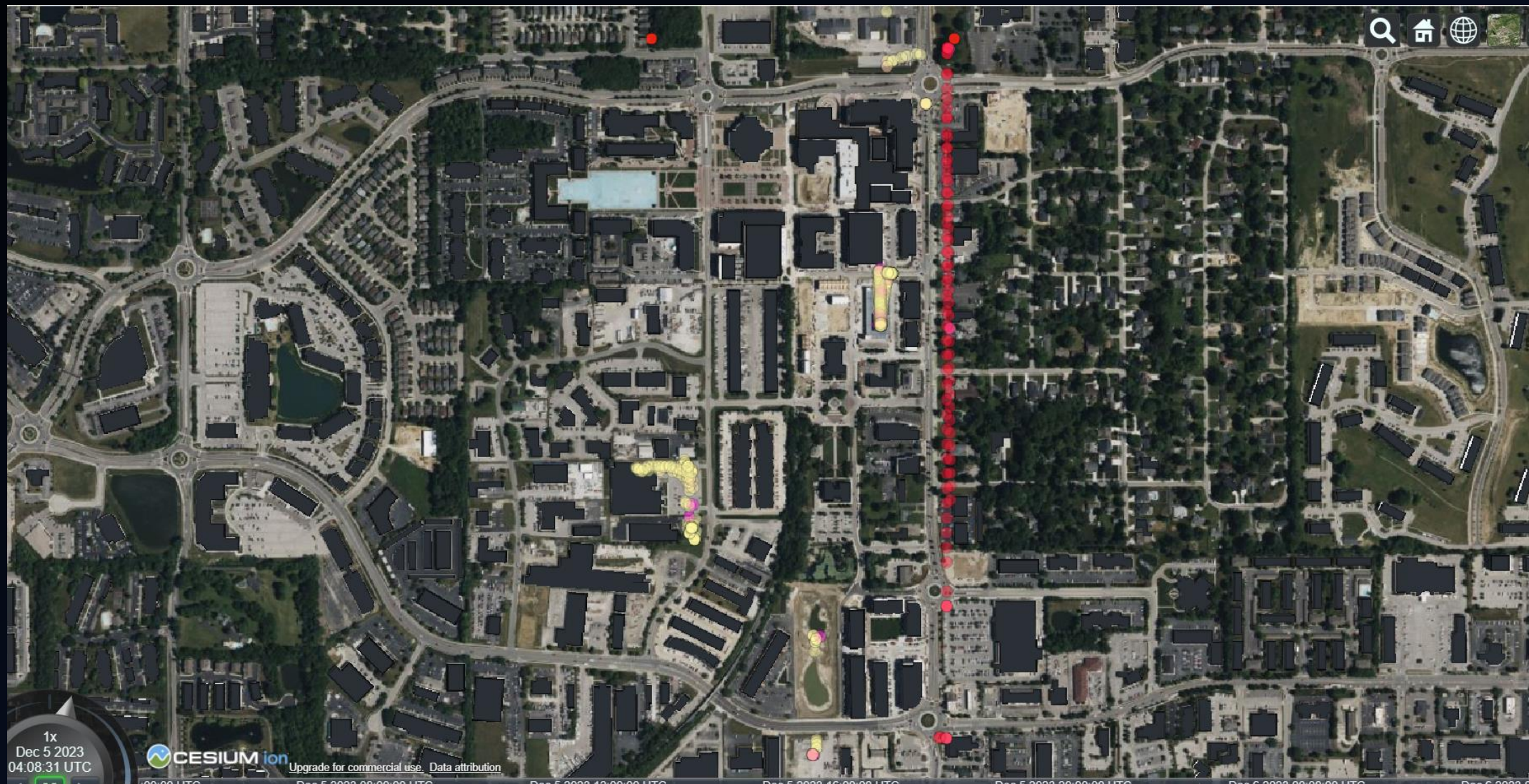
- Was happy that we got Cesium working with the project.
- Liked the number of tests we had.
- Liked that we were able to break/clean up the code more than it originally was
- Liked the direction we were taking for 13 features

Client Feedback

- Project and code seems awesome so far.
- Our project is something the client would be confident to show to the CEO and CTO.
- Believes that having a button of some sort that will allow you to see both the real and the fake drone (filter) flight paths would be beneficial.
- Recommends that having a configuration file would be practical in our project due to some functions have similar code.

[illegible]

Turn Text-Based UI into a GUI



Turn Text-Based UI into a GUI (2nd view)



Distinguish clean data and show those data points

```
SpooferDetector
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

amber@SurfaceLaptopGo MINGW64 ~/OneDrive - Ball State University/git_repo/SpooferDetector
(main)
$ /usr/bin/env C:\Program Files\Java\jre8\bin\java.exe @C:\Users\amber\AppData\Local\Temp\cp_5dq2lj6hyefxvrmxy2z0lnc6.argfile Model.DataProcessor
UID with missing or empty latitude or longitude: 1581F5FD228B00B502N
UID with missing or empty latitude or longitude: CoT Test Message
UID with missing or empty latitude or longitude: 1581F67QD233J0140348
UID with missing or empty latitude or longitude: d4a1a4ac21e3b566c5
UID with missing or empty latitude or longitude: e36393f297a5
UID with missing or empty latitude or longitude: e3e0744fee48
UID with missing or empty latitude or longitude: d024a45b1a74

UID Count: 11
Total Json Item Count: 28836
Clean Count: 27930

Unique IDs: [1581F67QD233J0140348, ecbb464826e9, e36393f297a5, d024a45b1a74, 1581F5FD228B00B502N, CoT Test Message, 1581F5YHC22B50021T5B, d4a1a4ac21e3b566c5, fc08ade8baf, e3e0744fee48, 5a85b46c633b629a25]

JsonObject in SpeedEvaluation: {"id":"4775956","mode":"INPUT","timestamp":"03:52.2","uid":"fc08ade8baf","origin_address":"6","origin_point_latitude":"","origin_point_longitude":"","origin_point_heading":"","origin_point_speed":"","origin_point_altitude_msl_geodetic":"","origin_point_altitude_barometric_meters":"","origin_point_altitude_hae":"","point_latitude":"39.97035","point_longitude":"-86.128053","point_heading":"","point_speed":"","point_altitude_msl_geodetic":"","point_altitude_msl_barometric":"-1000","point_altitude_hae":"301","rid_details_rid_compliant":"1","rid_details_takeoff_location_latitude":"","rid_details_takeoff_location_longitude":"","rid_details_takeoff_location_heading":"","rid_details_takeoff_location_speed":"","rid_details_takeoff_location_altitude_msl_geodetic":"","rid_details_takeoff_location_altitude_barometric":"","rid_details_takeoff_location_altitude_hae":"","rid_radio_bluetooth_rssi":"-78","rid_radio_wifi_rssi":"0","rid_radio_estimated_receive_interval":"0","identity_aircraft_serial_number":"","identity_aircraft_faa_registration":"","identity_first_name":"","identity_middle_name":"","identity_last_name":"","identity_organization":"","identity_phone_number":"","identity_email":"","database_only_human_notes":""}
Speed Evaluation: 0

UID: 1581F67QD233J0140348
Number of unique sets of coordinates: 3

UID: ecbb464826e9
Number of unique sets of coordinates: 2

UID: d024a45b1a74
Number of unique sets of coordinates: 4

UID: 1581F5FD228B00B502N
Number of unique sets of coordinates: 2
```

```
SpooferDetector
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

Speed Evaluation: 0

UID: 1581F67QD233J0140348
Number of unique sets of coordinates: 3

UID: ecbb464826e9
Number of unique sets of coordinates: 2

UID: d024a45b1a74
Number of unique sets of coordinates: 4

UID: 1581F5FD228B00B502N
Number of unique sets of coordinates: 2

UID: 1581F5YHC22B50021T5B
Number of unique sets of coordinates: 22

UID: d4a1a4ac21e3b566c5
Number of unique sets of coordinates: 559

UID: fc08ade8baf
Number of unique sets of coordinates: 2

UID: e3e0744fee48
Number of unique sets of coordinates: 2

UID: 5a85b46c633b629a25
Number of unique sets of coordinates: 81

Total number of unique sets of coordinates: 677
JSON objects written to C:\Users\amber\OneDrive - Ball State University\git_repo\SpooferDetector\Project\src\main\resources\cesiumOutput.json
```

This JSON file is created, and these points are plotted on the Cesium map.

Put JSON information back into the database

- The client has informed us that until they get their test servers up, this is not a feature that we can work on. So far, we only know that this will be sometime after Christmas.

Planned Iteration 3 Features

- Button that will allow us to see all data (fake and real) and to see sorted data.
- Connect to the client server to show real time data.

Retrospection

- What do you think about making your software more quality by adding the other properties (modularity, testing, clean code, etc.)?
 - Leah: It's much easier to read, easier to test, and much more concise. It has also been made much more modular and will be easier to update as the project grows.
 - Sam: I think our code is far cleaner now than it was, which took it from being a large and intimidating project and code base to a much smaller and easier to read project. Testing helped us to nail down requirements.
 - Logan: As expected, it is much easier for the developer to read and test, which are both equally important to ensure the code runs as needed. Modularity is the main key, where each module can be tested for input/output.
 - Ashley: Clean code has made it easier for us to read each other's code and be able to write tests for it. Having quality code is more than just making a quality product for the customer, it's quality for the developer as well.
 - Michaela: This iteration, quality was something we decided to focus on in our code and I do believe it was beneficial. Everyone understands the code better and we can ensure our code works well with no failures or warnings. Our code is also much easier to read with modularization being implemented.

Retrospection Part 2

- What does each member think about this iteration?
 - Leah: I'm very happy with our progress and I am glad we started with perhaps more than we needed and pruned it from there. We ended up keeping most of the functionality we started with; it's now just better organized. I think this means that our ideas were on the right track when we started out. I think we have reached the point where our work will mostly continue to be easier from here on out.
 - Sam: I feel that this iteration was a smashing success. We got a ton done and we took it from being the ugly duckling in the first iteration and turned it into a something clean and functional. All the work we put into the first iteration paid off here.
 - Logan: I think the foundation we built in I1 is stronger now, and with the very limited amount of time we had this iteration, I am proud of the features that have been implemented this iteration, and the direction it is going to go next iteration.
 - Ashley: I feel as though we really utilized our in-person programming time and really lit a fire under us. That momentum carried through the rest of the iteration, and we were able to accomplish a lot because of it. We're also learning how to work with each other a lot better.
 - Michaela: I feel that with this iteration even though we had a tight deadline with break in the middle of the iteration, I feel like we as a group got a lot done and we have also improved working as a group.

Retrospection Part 3

- How do you plan to approach iteration 3?
 - Leah: I'm looking forward to working more with everyone in person and continuing to learn how to do new things. I'm also excited about working on the way the project looks.
 - Sam: We now have a lot of directions that we can go for iteration three. Our client wants us to have fun with and be creative with this project, so we will add in some new core functionalities and then polish it up with some cool additions to the display.
 - Logan: After winter break, we can hopefully make time in our schedules to do in-person team meetings, hopefully to pair/mob program more.
 - Ashley: I plan to approach I3 with more drive and more ideas. I'm ready to make it look pretty.
 - Michaela: I plan to approach iteration 3 with more confidence and ideas. I'm excited with how this project will turn out.

