Python in the enterprise
mini-project #1: Flight recorder simulator

Dawid Gerstel

April 18, 2016

The objective was to create an application processing previously recorded flight parameters – read from a text file. The flight data are assumed to be csv files from the Tacview flight simulator, however the application should enable quick customisation to different input data with all the necessary parameters.

The next section describes baseline of the project envisaged at its beginning.

1 Application overview

The Tacview data contain (csv file columns) the following:

- time [sec] – expressed with respect to the aircraft launching
- Longitude [deg]
- Latitude [deg]
- Altitude [ft]
- Roll [deg] – plane's rotation perpendicular to its direction
- Pitch [deg] – plane's elevation angle
- Yaw [deg] – plane's orientation relative to the North

The above data let analyse recorded flight in terms of plane's:

- position and orientation – direct plotting the input parameters comprising plane's trajectory; extreme (untolerable) aircraft's orientations should be noted (e.g. nearly vertical pitch)
- velocities – translational and rotational; speed
- accelerations – interesting because the crew (and passengers) are sensitive to these

2 Project content

The project was entirely performed using jupyter notebook (the newest version of ipython notebook) that actually runs Python kernel on a local machine. Such approach, enabled combing interactive code developing with high quality text formatting, hence the project description including its full code is available in the jupyter-notebook `../code/FlightAnalyser.ipynb`. However, due to many library dependencies it is more convenient to browse the project in a non-interactive format that is available in an html document: `../documents/FlightAnalyser.html`.

Additionally, the code alone is extracted in the file: `../code/FlightAnalyser.py`

3 Summary of project developing

Although, the author was initially inspired to work on a daily basis on the project – due to other duties it became tremendously challenging to regularly find time slots for developing the project [1].

Instead, the project has been created in many sessions, usually a few days apart. The project was begun 28.03 and effectively finished 17.04.

The main benefits of this project are firstly reviewing concepts of Python programming (especially object-oriented design and trying to program in idiomatic Python) and secondly familiarising oneself with jupyter notebook, which is in author's opinion very pragmatic method of sharing well-documented results including techniques they have been obtained with.

---

[1]This is by no means an excuse, but merely an observation.