Automated detection of emergency landing sites for aircraft/drones

Using open source software SPy and its Python API

Introduction

The company Amazon recently announced they are developing aerial drone systems to deliver packages to customers. Other companies have followed suit with announcing the incorporation of drones into their services. However, as good as these systems are, fail safes need to be in place in the event of failure. That’s where remote sensing can help, by providing analysis of the area where these machines operate.

Objective question

Where can a drone safely land, given that it has a limited range from a point of failure?

Objective overview

This is meant as a dynamic solution to the question posed previously. The goal is to leverage open-source software to solve a problem that applies to not just one specific location at a specific time, but any location at any time. This also simplifies the reproducibility since all actions performed on the data is documented in the code. This will be achieved with open source GRASS GIS, and Python.

Data overview

The test data used for this project came from Geomatic Canada, and is in Geotiff format. The code developed for this project should accept any data in a GeoTiff or .lan format. The metadata file for the test is located in the Github repository.

Data Details

Landsat 7 Orthoimage

Product\_Date - 2002/04/15

Datum - NAD83 (CSRS)

Projection - LCC

UTM\_zone - 00

Horizontal\_Positional\_Accuracy\_Value - 22

Digital\_Elevation\_Model\_Accuracy\_Value - 101

Originator - Geomatic Canada, Centre for Topographic Information / Géomatique Canada, Centre d'information topographique

Methodology

References

* Software
  + Spectral Python (Spy), created by Thomas Boggs, <http://spectralpython.sourceforge.net/index.html>
  + Python Software Foundation. Python Language Reference, version 2.7. Available at [http://www.python.org](http://www.python.org/)
  + Source code available on my Github account: <https://github.com/Farm8763>
* Data