

On the Positional Accuracy of the Google Earth™ Imagery

The amazing things about Google Earth™...

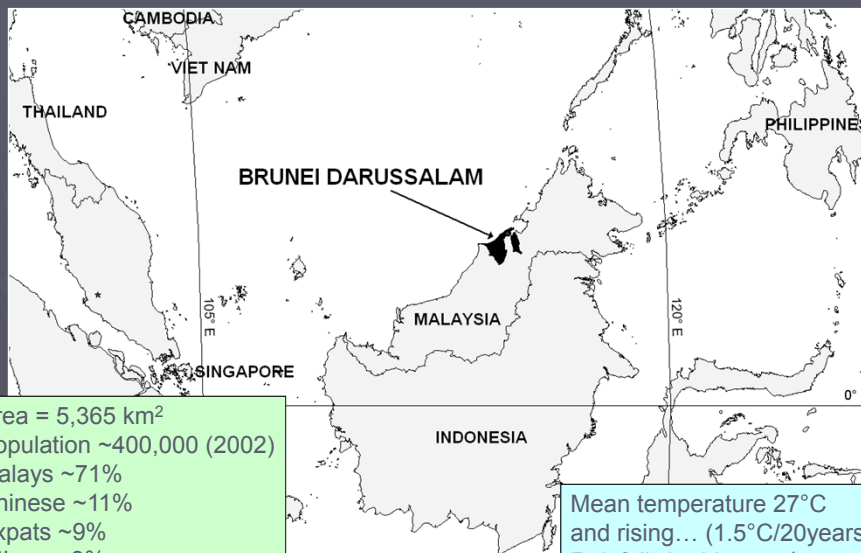


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&
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Google Earth™: 4°58'27"N, 114°53'35"E
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$\phi = 4^{\circ} 58' 28''$
 $\lambda = 114^{\circ} 53' 35''$

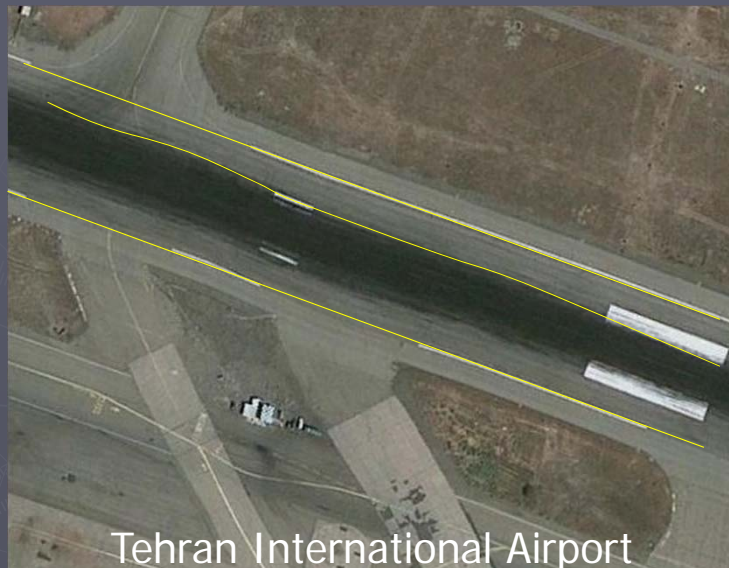
The geographic context



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Errors in Google Earth™



The international border between Brunei and Malaysia...



Errors in Google Earth™



(a)



(b)

(a) Shows part of a cleared land with a large, circular man-made structure fading into forest, possibly due to the use of old imagery;

(b) An example of a georegistration error that breaks a linear structure and surrounding areas.

What is GEDTF?

The Global Elevation Data Testing Facility is a database of features found in the world that are flat, large (>500 m by 15 m) and having smooth homogeneous surface. At present, the database contains about 8,500 runways.

With its strict technical parameters, runway can be a test bed for a range of calibration and accuracy assessment tasks of the air- and space-borne measurement systems.

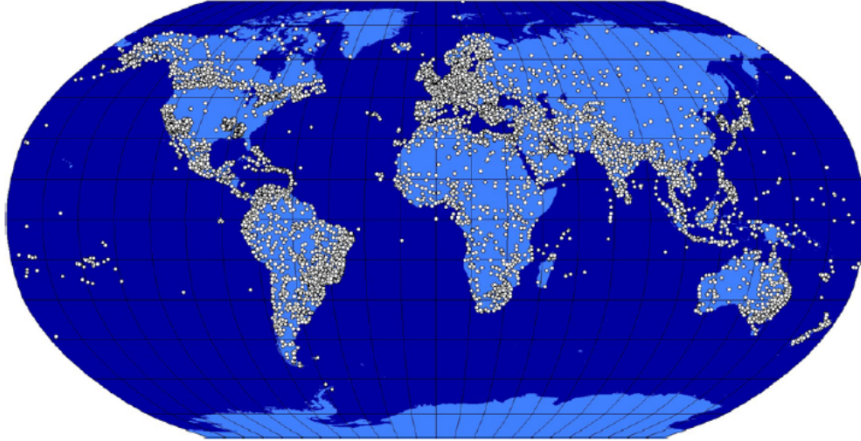
The GEDTF database

The data for the GEDTF were compiled from various sources.

The structure of a record includes:

- Region of the world.
- Country.
- Airport name.
- Runway number.
- Latitude and longitude of both ends of runway.
- Elevations of both ends of runway.
- Length and width of the runway.
- Type of surface material (Asphalt, concrete, turf, etc).

Global Elevation Data Testing Facility (GEDTF)

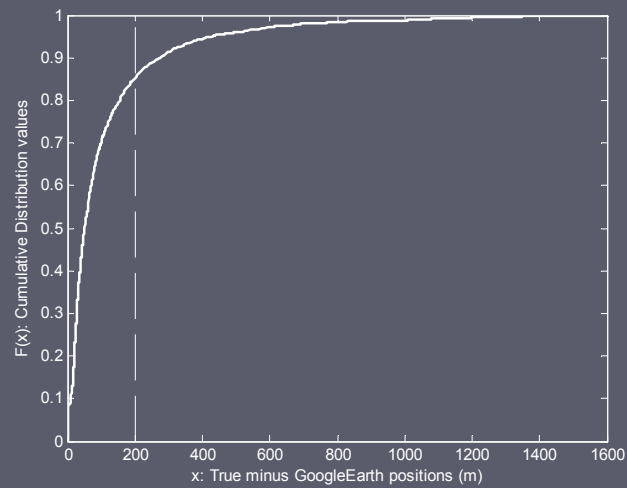
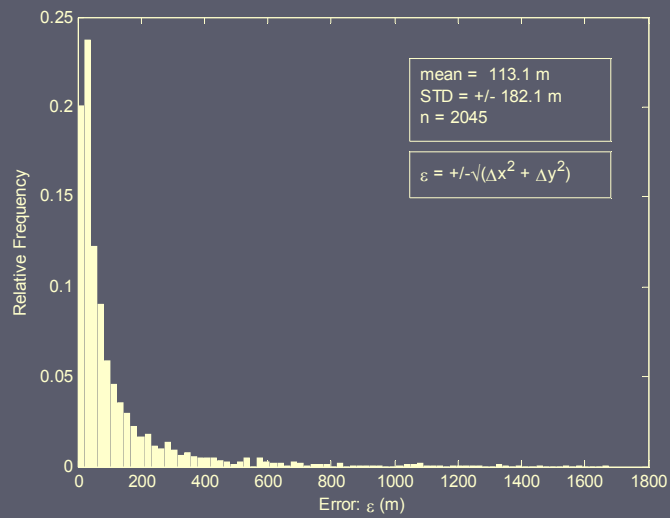


Location of about 8,235 runways are shown here.
Note, not all runways in the US are included.

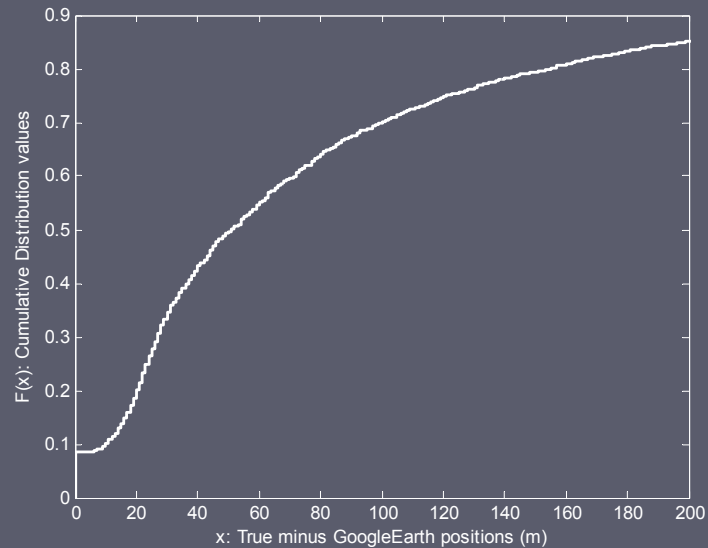
The geographical spread of the control points (runway features)

Location	Africa	Australia	Euroasia	North America	South America	Other
No. of runways	204	208	810	376	408	34

Histogram of the Google Earth™ errors



The Cumulative Distribution Function (CDF) of the disparities in runway positions. A region bordered by the y-axis and the dashed line is shown in Figure 3 in an enlarged form.



The CDF of disparities in runway positions ≤ 200 m

Conclusion

- ▶ As Google acquires more updated and higher-resolution images it is hoped that the GoogleEarth™ application will display these images accurately to offer viewers a truly "seamless" viewing experience.
- ▶ The Google Earth™, at the moment, provides plenty of viewing pleasure and allows access to hard-to-reach places. However, as a navigation tool it is clearly flawed – with errors of more than 1.5 km in some cases.
- ▶ Do not use the GoogleEarth™ imagery as a source of georeferenced data!

The Google Earth™ blog

- ▶ www.gearthblog.com/blog/archives/2009/03/about_google_earth_imagery_1.html

Thank you, and please visit
Brunei Darussalam!



Nepenthes L.