

# Runway Centerline Deviation Study

PI: Charles K. Toth, Co-PI: Dorota A. Grejner-Brzezinska

Sponsor: Federal Aviation Administration (FAA)

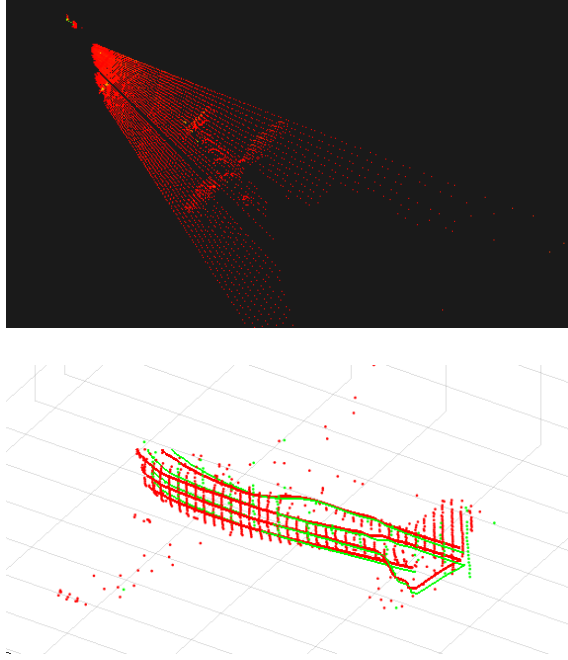


Figure 1. Aircraft scan and reconstructed surface.

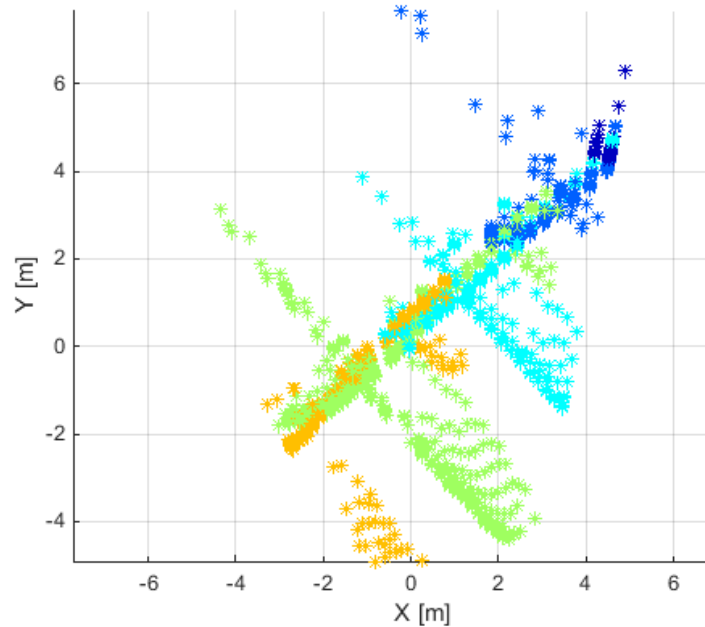


Figure 2. Motion estimation from aircraft point clouds.

The main objective is to estimate the positions of aircraft relative to runway centerline along the course of aircraft departure and arrival profiles, so as to determine the amount of safety area may be required for specifications such as total pavement width, taxi lane separation, and safety area width to ensure against wingtip conflicts and base landing gear deviations from pavement, for relatively large aircraft on relatively small taxiways and runways.

It is proposed that a variety of technologies be considered to collect centerline deviation data. For example, laser sensors projecting across the width of pavement and/or in pavement sensors may be installed along the centerlines of both runways and taxiways may be used as accurate methods of centerline deviation measurement. In addition, aircraft identification data may be collected via high-definition cameras located on either end of the runway's threshold.

This study will consist of a comprehensive empirical analysis of departures and arrivals of a variety of aircraft utilizing a number of general aviation airports; in particular, those that are owned, operated, or otherwise affiliated with PEGASAS universities. From data collected, a statistical analysis of centerline deviations will be performed. From these results a risk model may be developed to determine the best allowance of aircraft of varying landing gear configurations, wing spans, and approach speeds, to utilize runways and taxiways of various dimensional standards.