FIG WORKING WEEK 2019

22-26 April, Hanoi, Vietnam

"Geospatial Information for a Smarter Life and Environmental Resilience"

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Project "ELEVAR" – Study of Vertical Structures with Robotized Aircrafts

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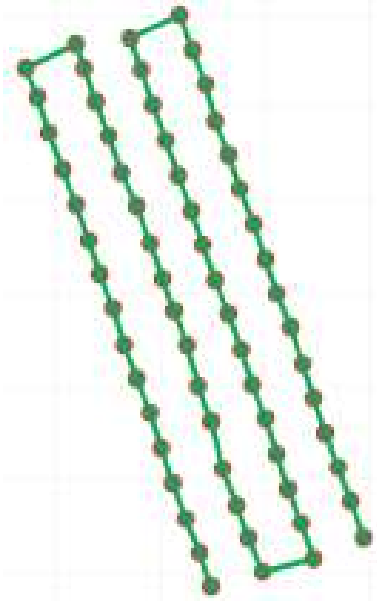
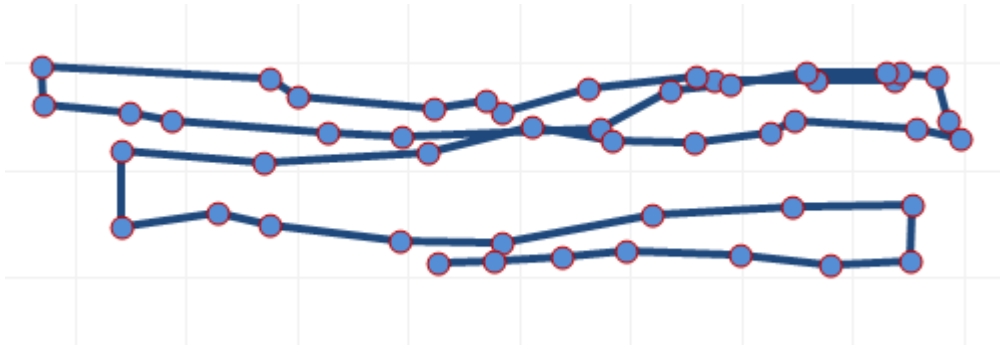
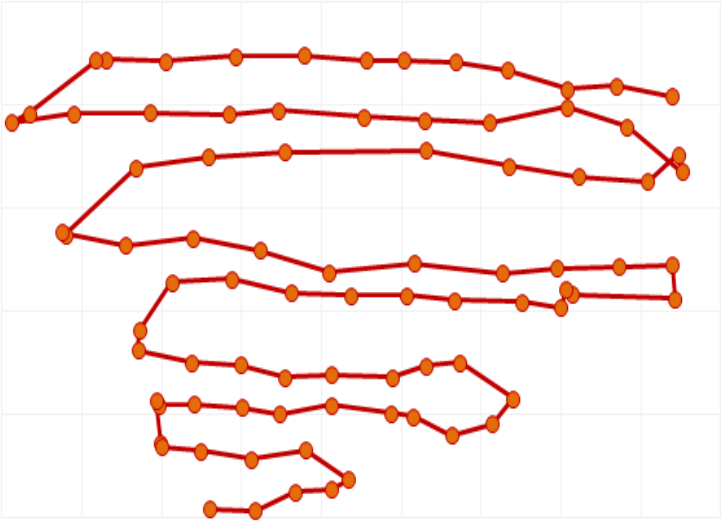


Motivation

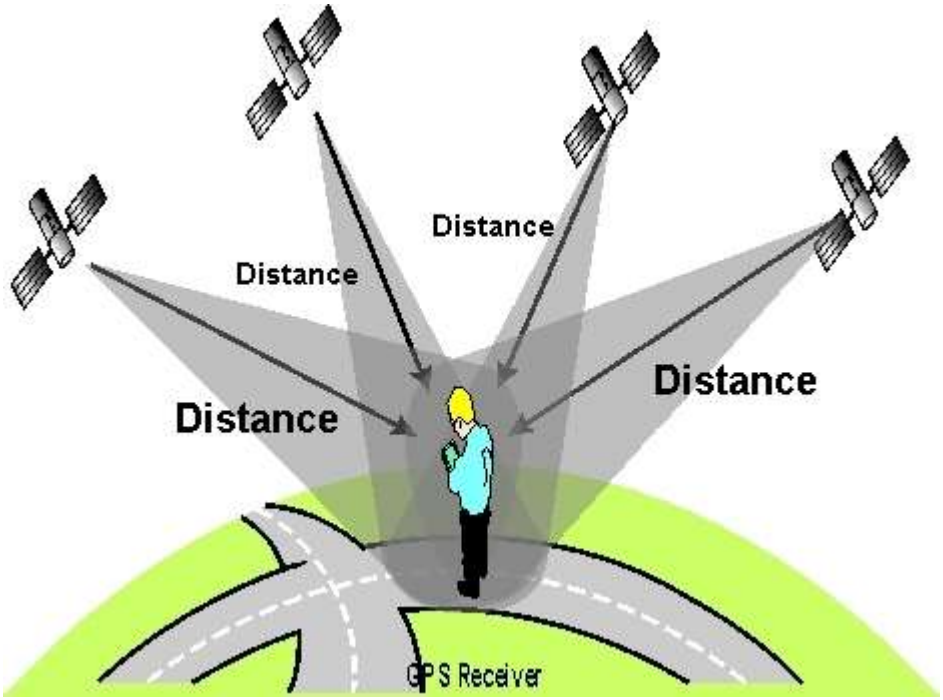
Flight path. Autonomous flight of a drone over a breakwater



Flight path. Manual flight of a drone in front of a dam (October 2017)

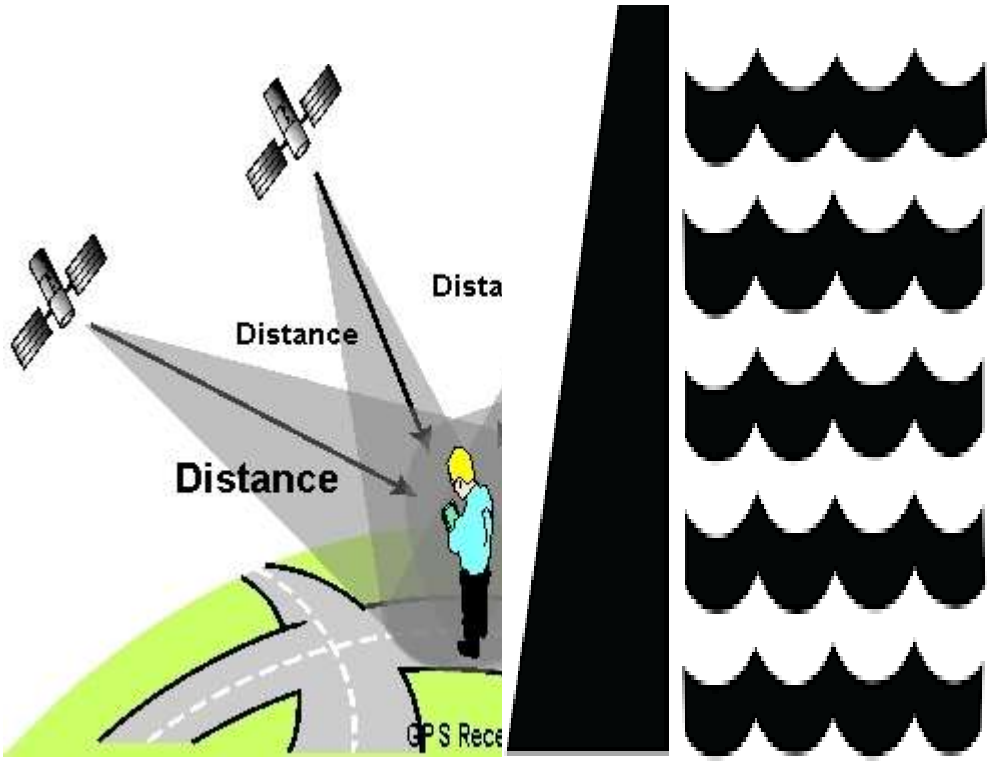


Flight path. Manual flight of a drone in front of a dam (June 2018)



Good Positioning

Depends on the access to data from GNSS satellites



Bad Positioning

Solution : develop an aerial platform that is not 100% dependent of GNSS signals

Consortium

tekever
AEROSPACE | DEFENSE | SECURITY

TÉCNICO LISBOA

Institute for Systems and Robotics | LISBOA

LNEC LABORATÓRIO NACIONAL DE ENGENHARIA CIVIL

- Normal camera
- Video camera
- Stereoscopic camera for 3D modulation of the surrounding environment
- Lidar (for obstacles avoidance)
- Inertial sensor (3D accelerometers, gyroscopes and magnetometers)
- GPS receiver
- Computer

Real-time visual-inertial navigation is performed in an incremental fashion, by calculating the transformation between consecutive capture instants.

It starts with the detection of salient points in a pair of frames.

This information is merged with information about the cameras.

The result is a 3D point position of points(sparse point cloud)

If the environment is static the trajectory from start-up point is determined and a sparse 3D point cloud of the environment is created

Tests


GPS2
POS
GPSB

50% of the team of project Elevar