HARMONIOUS

UAS Techniques for Environmental Monitoring

Miguel Á. Manso (UPM), Valencia, February 15th 2018

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EUROPEAN COOPERATION
IN SCIENCE & TECHNOLOGY

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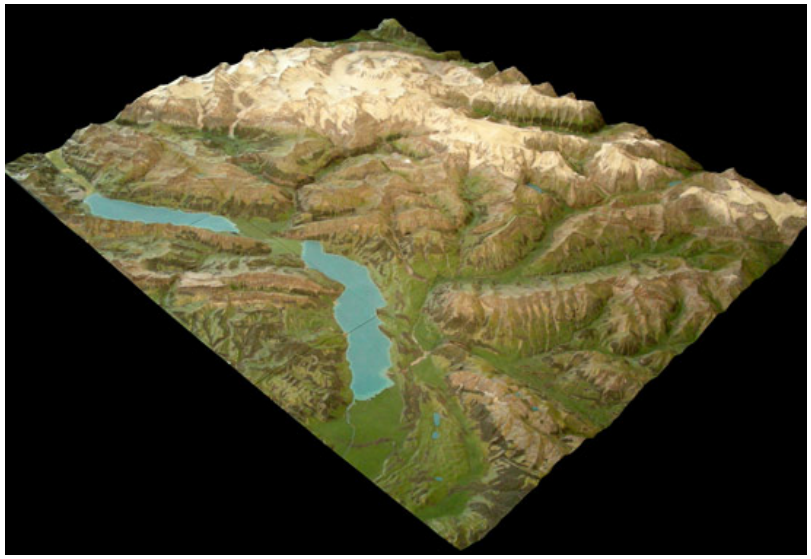
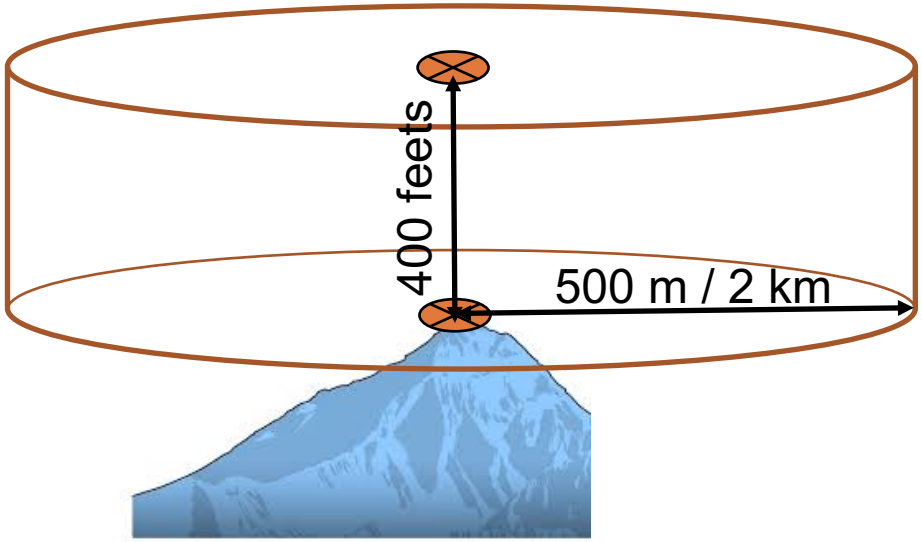
The importance of altimetry (altitude) in the UAV/RPAS missions design

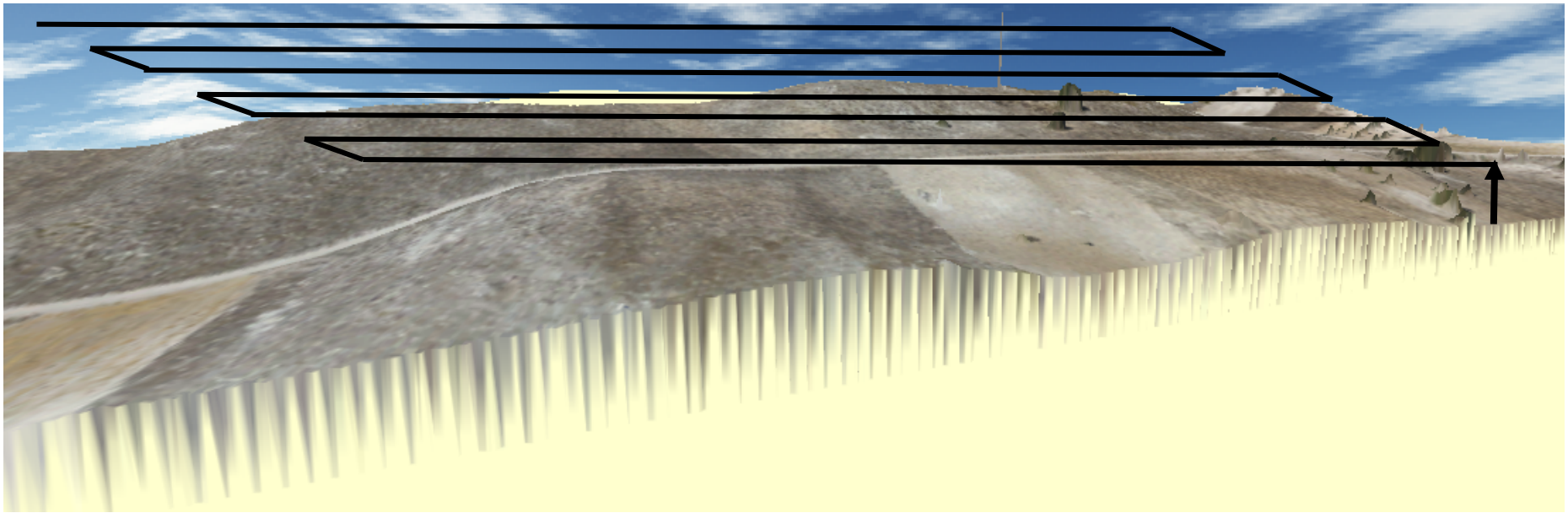
- Terrain relief is important in UAV / RPAS missions for several reasons



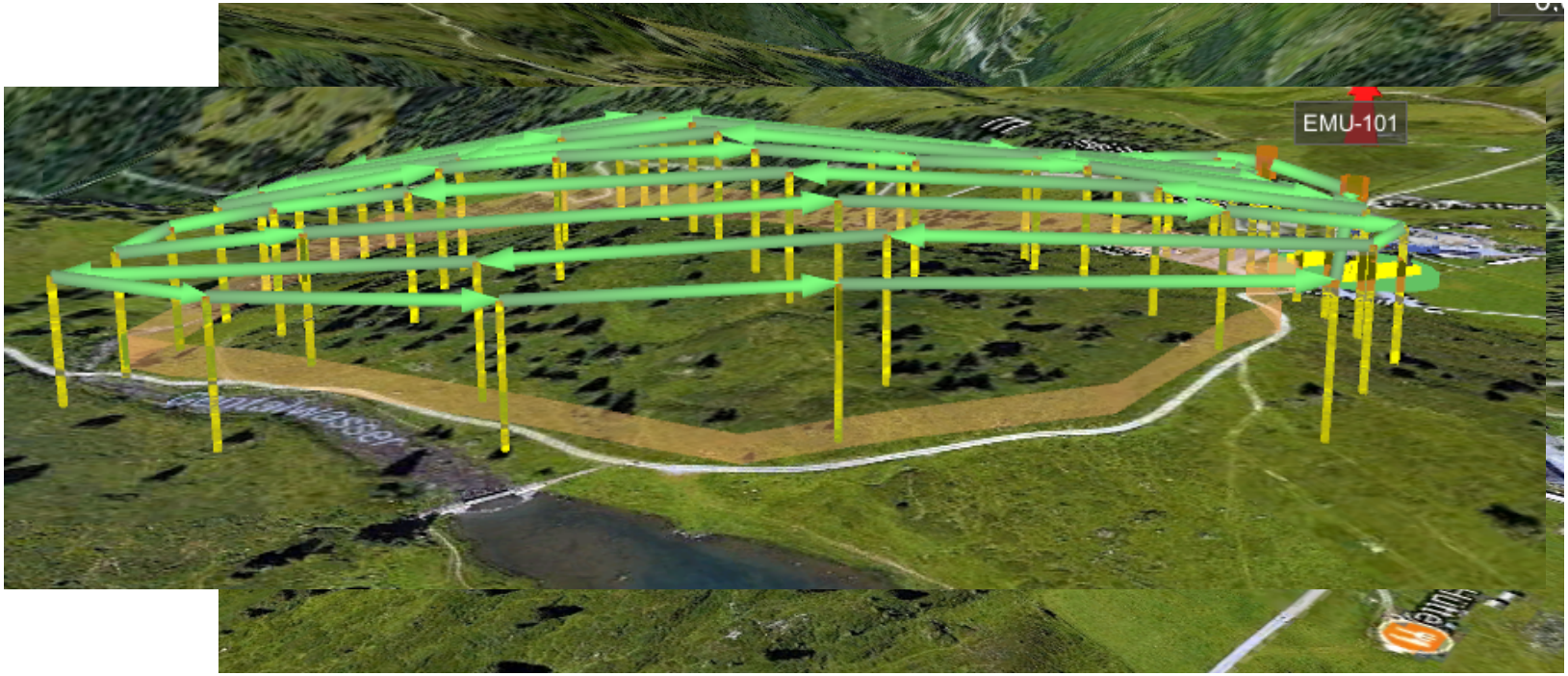
First comply with the regulations: maximum flight height (in Spain 400 feets above the highest point of the area to fly).



Second, in order to define flight missions whose 3D path does not intercept any obstacle type.

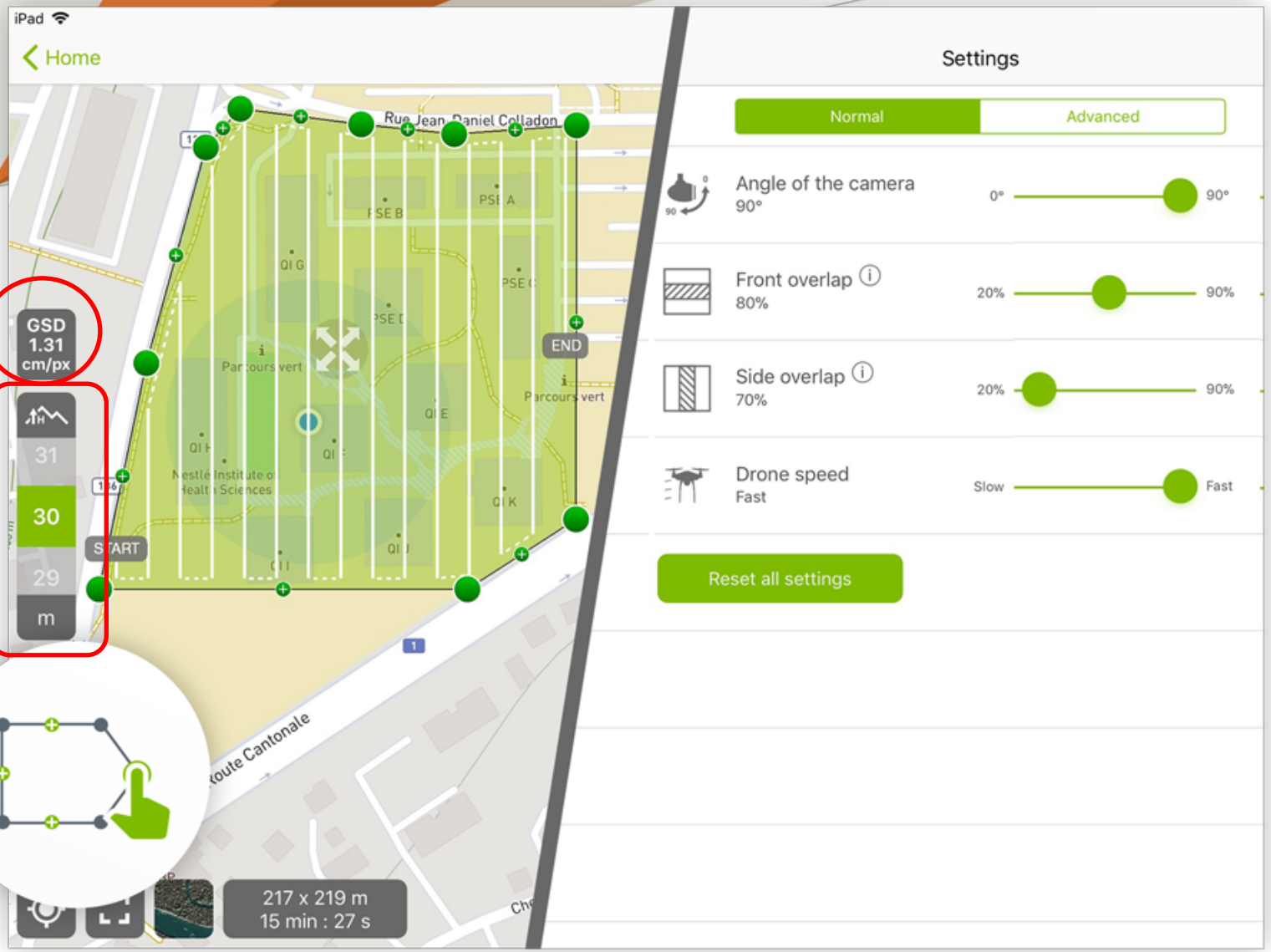


Third to define 3D flight paths that follows the relief in order to maintain uniform the observation's Ground Sample Distance (GSD).



What is the problem?

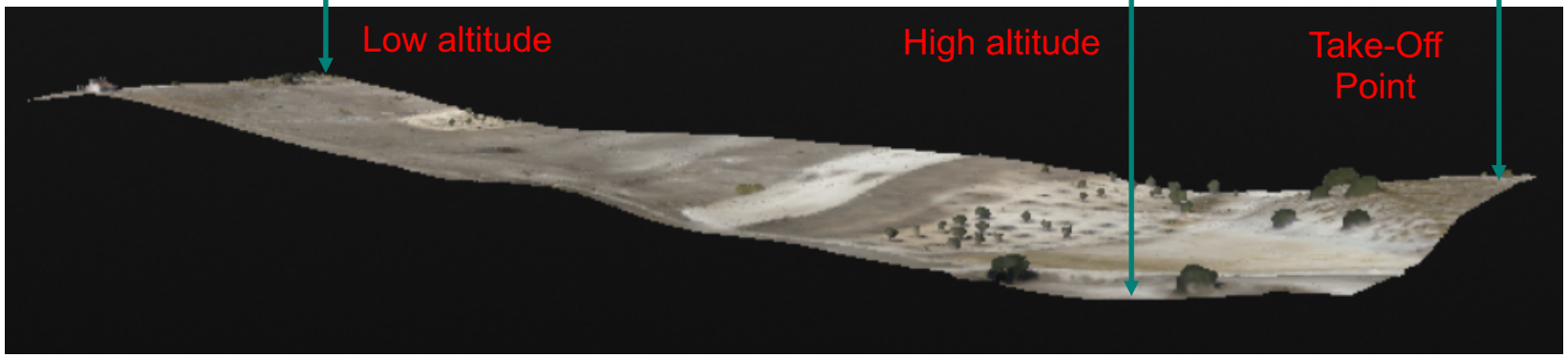
- flight missions design within ground control software:
  - Very few applications (UgCS, eMotion 3) use digital terrain models to adjust the height Path of the mission to the relief in order to maintain uniform GSD.
  - The rest define a flight height relative to the *Take Off* point.
  - In many cases you can select a survey mission (polygon or rectangle) and select either the GSD size or the height, obtaining the opposite. It is usually possible to define the angle of the passes in the polygon,% of overlapping and how they acquire the strips.



Source: Pix4DCapture

The problem from a graphic point of view

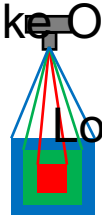
Constan flight height



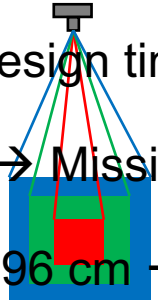
e.g. Take-Off height 70 m, GSD 2.3 cm → Design time

Low altitude 44.4 m, GSD 1,45 cm → Mission time

Low GSD



High GSD



High altitude 89.8 m, GSD 2,96 cm → Mission time

Average GSD 2,1 cm → Processing time

Conclusion

- In addition to advancing the models, algorithms and calculation implementations for the corrections (objective 1.1 WG1), we should move forward in the design and implementation of intelligent applications for the design of flight missions, which guarantee:
  - the safety of the operation, and
  - defining flight paths that generate *uniform* GSD
- All this so that the final products: orthoimages, surface models, indexes of any kind, are homogeneous.

- Thank you!!

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