

Introduction to Structure from Motion (SfM) Photogrammetry for Earth Science Research and Education

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2016 GSA Short Course, Denver, CO

Introduction to SfM = lectures, hands-on data processing and analysis examples.

Overview of the basic principles of SfM, with emphasis on theory, application examples, software workflow basics, practical considerations.

Goal = solid intro to SfM and a foundation for future learning. We also hope that it will inspire you to explore the technology and to explore new applications in research and education.



Agenda...

Course page:

<http://kb.unavco.org/kb/article/2016-gsa-introduction-to-structure-from-motion-sfm-photogrammetry-for-earth-science-research-and-education-short-course-859.html>

- ***Name & affiliation?***
- ***Your interest in SfM & application area?***
- ***Previous SfM or lidar experience?***

Video...

<https://www.youtube.com/watch?v=yxLMk120vMU>

Airborne LiDAR



onboard GPS and IMU constrain position and orientation of aircraft

distance between scanner and ground return determined from delay between outgoing pulse and reflected return

laser pulse

shadow zone

laser pulse

Structure from Motion

motion of camera provides depth information

sequence of photographs

scene **structure** refers to both camera positions and orientations and the topography

features matched in multiple photographs

line of sight

Terrestrial LiDAR

lines show track of scan across ground
circles show actual ground return footprints

