Applications of Photogrammetry in Forensic Investigations

International Association of Forensics and Security Metrology

PMS AG
PHOTO MESS SYSTEIME

URC VENTURES

Eos Systems
Agenda

**Speaker: Eugene Liscio, IAFSM**
Introduction and Applications of Photogrammetry in Forensics  
Duration: 20 min

**Speaker: Harald Krause, Photo Mess Systeme**
Bloodstain Pattern Analysis in Elcovision 10  
Duration: 10 min

**Speaker: David Boardman, URC Ventures**
Dense Point Clouds & Aerial Photogrammetry  
Duration: 10 min

**Matt Klymson, Eos Systems**
Photogrammetric & Other Point Cloud Sources in PhotoModeler Scanner  
Duration: 10 min

**Questions:** 5 min
IAFSM (www.iafsm.org, info@iafsm.org)

Non-profit, professional association of users, service providers, and manufacturers of metrological techniques and technology working for the advancement of justice.

Promote the development and use of precision measurement systems, techniques and software in the generation of two- or three-dimensional coordinate spatial data for documentation, planning, analysis and/or presentation purposes in the service of justice.

Education through webinars, workshops, presentations, papers and conferences.
The term photogrammetry is derived from three Greek words:

“PHOTOS” = light or light rays
“GRAMMA” = drawn or written
“METRON” = to measure
Why Photogrammetry?

- Proliferation of cameras (and video) means they are abundant.
- Digital SLR cameras are still one of the most utilized tools at crime and accident scenes.
- Photogrammetry is a low cost solution when compared to total stations or laser scanners.
- Another tool for the toolbox.
Why the Recent Interest of Photogrammetry?

- 1980s–1990s: Digitizing tablets available, but the process of working with photogrammetry packages meant manual marking and referencing.


- Circa 2005: Dense reconstructions available

- 2006: Early form of automatic Image orientation

- 2008 and on: Bundler, Photosynth, 123D Catch, VisualSFM, CMPMVS and others doing fully automated construction from photos to finished mesh.
Scale Invariant Feature Transform (SIFT)

“Object Recognition from Local Scale-Invariant Features”, 1999
-David G. Lowe, University of British Columbia
Camera Orientations & 3D Features
Dense Reconstructions
Dense Reconstructions
What Are Most Common Photogrammetry Techniques

• Solve for 3D Points
• Use Targets for High Accuracy Projects
• Dense Point Clouds
• 3D Meshed and Textured Models
• Solve for Single Photographs
• Orthorectification of Images
Applications: Cartridge Case

Photographs  3D Textured Mesh  “Unrolled” Mesh
Applications: Footprint Documentation
Applications: Fire Investigation
Applications: Fire Investigation
Applications: General Crime Scene Modeling
Applications: General Crime Scene Modeling
Applications: Suspect Height Analysis