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Remote Image Management System

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Introduction

- During disasters, like forest fires, it helps to have a **real-time overview** of the terrain.
- This allows for quick and correct decisions based on **accurate live data**.
- Our remote image management system comprises
  - The **acquisition** and **transmission** of terrain data
  - The **processing** of the data in near real-time
  - The **presentation** of the processed data

Project Partners

- **VITO** : Java Master/Worker workflow for configuring and scheduling co-registration based composite generation jobs.
- **IncGeo** : C++ co-registration library
- **UGent** : C++ co-registration and composite generation algorithm

VITO + UGent : interface between "Sensor Input File System" and the VITO standard archiving workflow.

Crisis Management

- When a disaster occurs, a plane is sent to **survey the area**, equipped with
  - Video camera
  - GPS (+ INS)
  - Transmission equipment
- The live video data is sent to a mobile ground **control station**.
- It is then sent to a **computation cluster**, where the frames are combined into a **mosaic**.
- The result is placed **online**, and visible from anywhere.

Mercator-Low
Test flight 6 June 2006

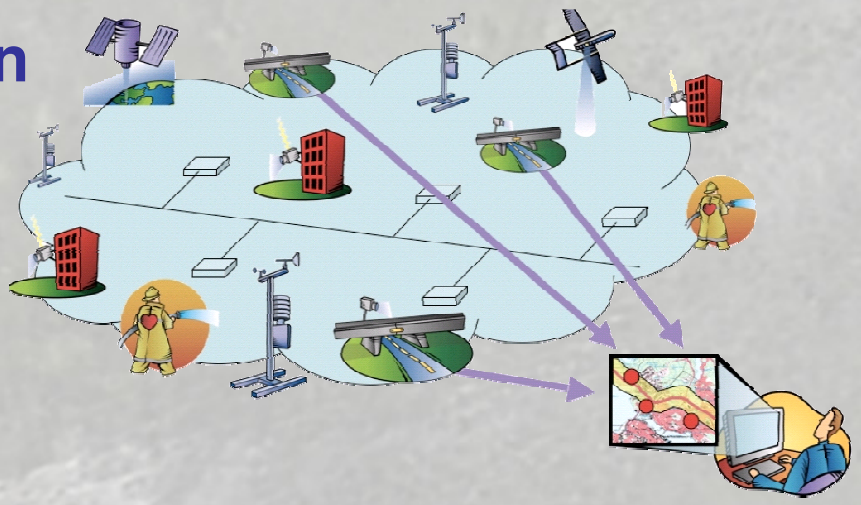
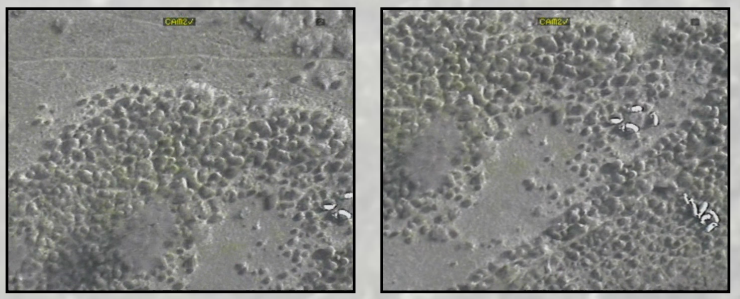
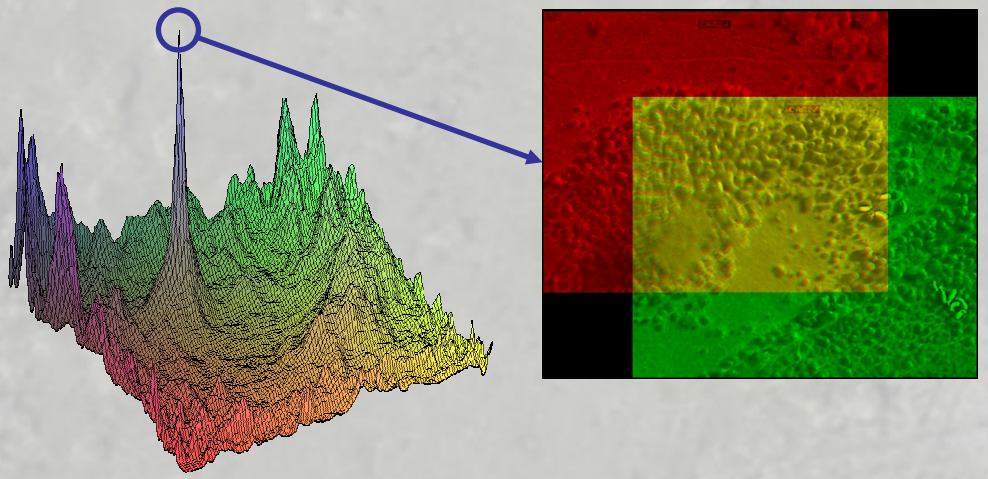


Image Registration

- Fast registration of 2 frames.

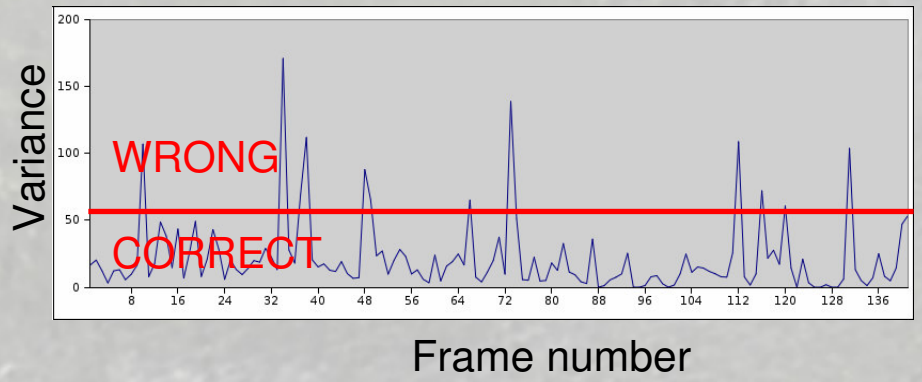




Maximization of $f(I_1,T(I_2))$,
with f = *mutual information*

- Error detection.

If the variance is higher than a **user-defined quality setting**, the registration is considered to be wrong.



Results

- The processed data is presented to the user as a **stitched image mosaic**.
- Example mosaic of 80 seconds of video data (2000 frames in total, about 200 used in this mosaic)