GeoSync – A Framework for Registering Terrain Photos with Geographic Maps

Robot Vision Lab
Purdue University

http://RVL.ecn.purdue.edu

Avi Kak (kak@purdue.edu)
Johnny Park (jpark@purdue.edu)

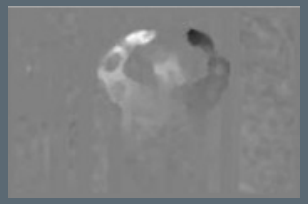
Purdue Robot Vision Lab (RVL)

- Over 30 years of experience in all facets of computer vision and image processing
- Rich tradition of active collaboration with industry
  - Developed vision-based line tracking system for Ford
  - Developed robust tracking of vehicles in wide-area surveillance video
  - Developed clinically verified CBIR system for large medical image databases
  - Developed a camera handoff protocol for surveillance with camera networks
- Current RVL members: 2 faculty, 1 research scientist, and 16 PhD students

Recent Projects

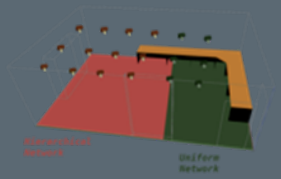
Tracking in wide area aerial video

Simultaneous segmentation and tracking

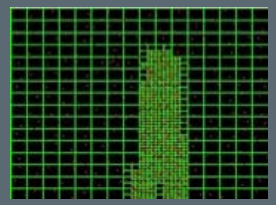


Robust motion estimation under varying illumination

Illumination invariant color representation



Research in wired/wireless camera networks



Hierarchical approach to fast background subtraction

3D object tracking

Content-based image retrieval from large medical image databases

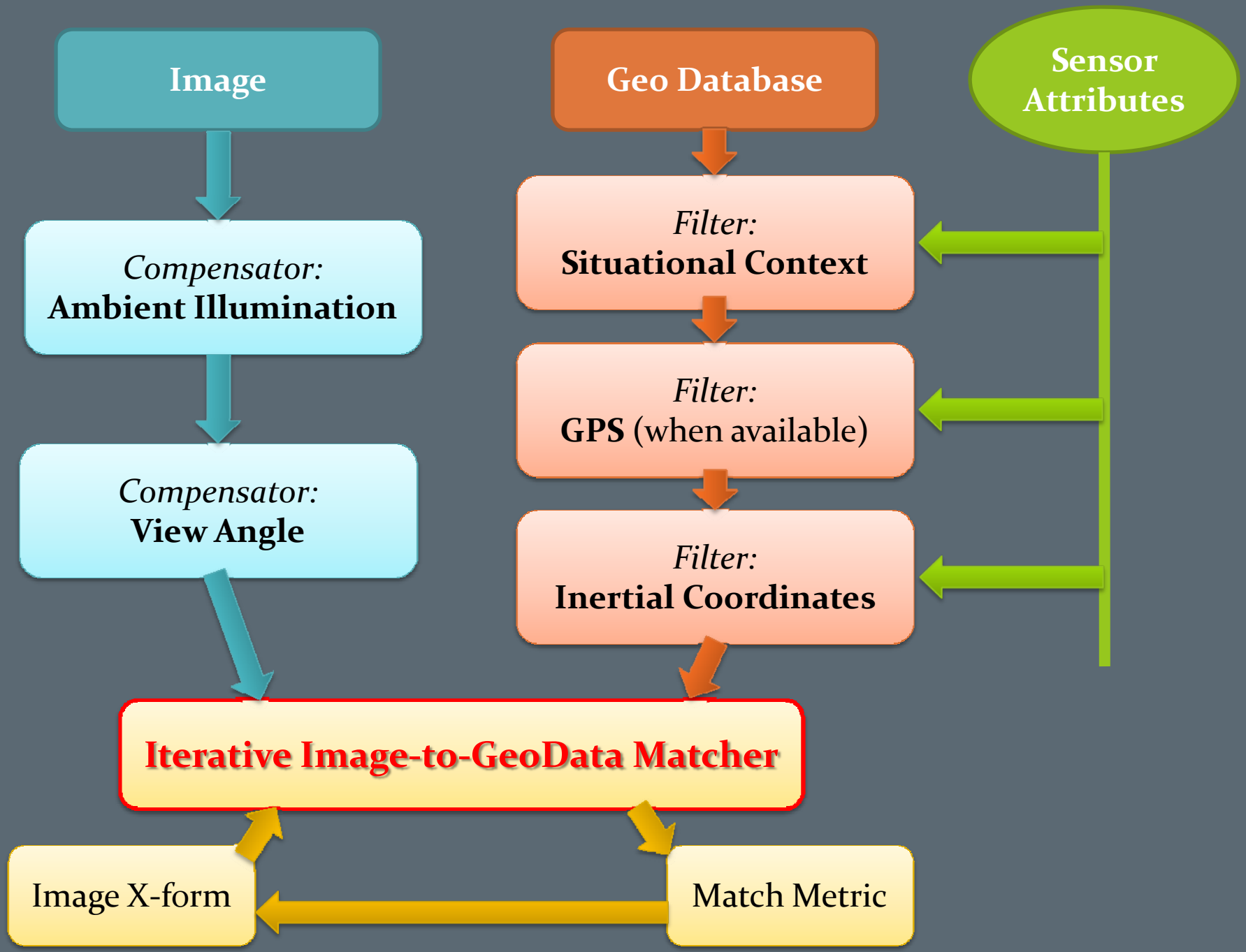


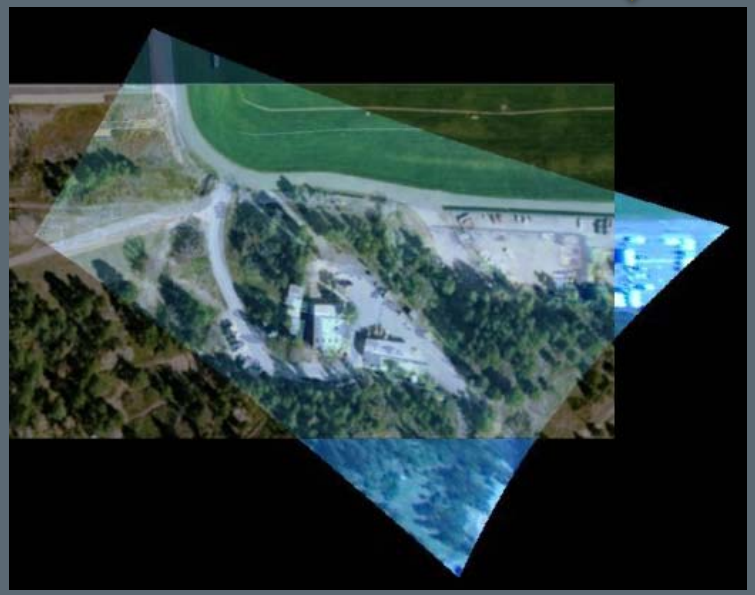
Image
Geo Database
Sensor Attributes
Compensator:
Ambient Illumination
Filter:
Situational Context
Compensator:
View Angle
Filter:
GPS (when available)
Filter:
Inertial Coordinates
Iterative Image-to-GeoData Matcher
Image X-form
Match Metric

: Geo Database
: Extracted lines in UAV image

Geo Database

Initial registration

After ICP

UAV image

Registered images