

Standardization of Sensor and Data Models

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ISO, OGC, ISPRS, EuroSDR

ISO/TS 19101-2 "Reference model – Part 2: Imagery"

ISO 19115-2 "Metadata – Part 2: Metadata for imagery and gridded data"

ISO 19130 "Sensor data models for imagery and gridded data"

Open Geospatial Consortium (OGC): Sensor Web Enablement

International Society for Photogrammetry and Remote Sensing (ISPRS) and European Spatial Data Research (EuroSDR): Calibration and Orientation

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ISO/TS 19101-2 "Reference model – Part 2: Imagery" (TS = Technical Specification)

Contents

Viewpoints according to RM-ODP (ISO/IEC 10746-x "Information technology – Open Distributed Processing – Reference Model")

Enterprise Viewpoint: Typical actors and their business activities

Information Viewpoint: Data structures

Computational Viewpoint: Individual processing services

Engineering Viewpoint: Deployment of information to physical locations

Dates

Committee Draft: January 2006

Planned publication as an International Standard: September 2007

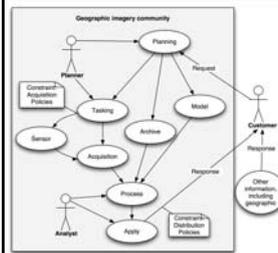
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ISO/TS 19101-2 "Reference model – Part 2: Imagery"

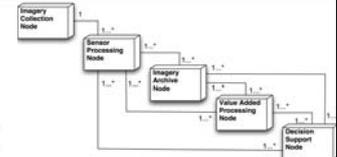
Illustration of two viewpoints:

Enterprise Viewpoint



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Information Viewpoint



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ISO 19115-2 "Metadata – Part 2: Metadata for imagery and gridded data"

Contents

| | |
|-------------------------|--|
| Data quality | eg processing steps, usability |
| Content information | eg bands, image description |
| Spatial representation | georectified data, eg orthophoto georeferenceable data, eg aerial image |
| Acquisition information | eg instrument, platform, objective |

Dates

Committee Draft: November 2005

Planned publication as an International Standard: March 2008

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ISO 19115-2 "Metadata – Part 2: Metadata for imagery and gridded data"

Link between ISO 19115-2 and national metadata standards for imagery:

Registry according to ISO 19135

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ISO 19130
“Sensor data models for imagery and gridded data”

Contents

Platforms: airborne
 spaceborne
 waterborne

Interior orientation: optics (focal length, principal point, distortion)

Exterior orientation: position, attitude
 ground control points
 GPS, Inertial Measurement Unit (IMU)
 functional fit model
 velocity, acceleration

Dates

Cancellation in March 2006 because of expiration of 5-year-period
 New Work Item Proposal:
 project leader from Seicorp (U.S.A.), editor from Germany

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ISO 19130
“Sensor data models for imagery and gridded data”

Examples of sensors: Digital aerial cameras



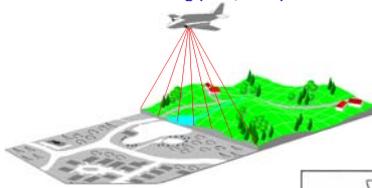
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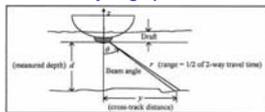
ISO 19130 “Sensor data models for imagery and gridded data”

Examples of sensors:

Airborne Laser Scanning (ALS, Lidar)



Hydrographic sonar



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Open Geospatial Consortium
Sensor Web Enablement (SWE)

Components

| | |
|--|---|
| Observations & Measurements (O&M) | encoding of O&M |
| Sensor Model Language (SensorML) | position and attitude of sensors |
| Transducer Model Language (TransducerML or TML) | position and attitude of sensors |
| Sensor Observation Service (SOS) | request, filtering, and retrieval of observations |
| Sensor Planning Service (SPS) | planning of sensor measurements |
| Sensor Alert Service (SAS) | publication of alerts from sensors |
| Web Notification Services (WNS) | asynchronous delivery of messages |

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International Society for Photogrammetry and Remote Sensing (ISPRS) and European Spatial Data Research (EuroSDR): Calibration and Orientation

Topics

- Direct sensor orientation
- Misalignment calibration of Inertial Measurement Unit (IMU) and digital aerial camera
- Geometric and radiometric calibration of multi-head / multispectral cameras
- Calibration of Optical Satellite Sensors
- Ground test-fields for digital cameras

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Thank you

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