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PD ISO/TS 19130-3:2022



BSI Standards Publication

Geographic information — Imagery sensor models for geopositioning

Part 3: Implementation schema

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National foreword

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A list of organizations represented on this committee can be obtained on request to its committee manager.

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Part 3: Implementation schema

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Foreword

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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This document was prepared by Technical Committee ISO/TC 211, *Geographic information/Geomatics*.

A list of all parts in the ISO 19130 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

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Introduction

Vast amounts of data from imaging systems have been collected, processed and distributed by government mapping and remote sensing agencies and commercial data vendors. Additional processing is often needed to make these data useful in the extraction of further geographic information. Geopositioning, which determines the ground coordinates of an object from image coordinates, is a fundamental step in the extraction process. Because of the diversity of sensor types and the lack of a common sensor model standard, data from different producers may contain different parametric information, lack parameters required to describe the sensor that produces the data, or lack ancillary information necessary for geopositioning. A separate software package must often be developed to deal with data from individual sensors or data producers. Standard sensor models and geolocation metadata allow agencies or vendors to develop generalized software products that are applicable to data from multiple data producers or multiple sensors. With such standards, producers can describe the geolocation information of their data in the same way, thus promoting the interoperability of data between application systems and facilitating data exchange and integration.

ISO and OGC have independently defined relevant specifications to standardize the description of sensor models, though a fundamental difference exists between them.

ISO 19130-1 provided a location model and metadata relevant to all sensors. It included metadata specific to whiskbroom, pushbroom and frame sensors, and some metadata for synthetic aperture radar (SAR) sensors. In addition, it provided metadata for functional fit geopositioning. ISO/TS 19130-2extended the specification of the set of metadata elements required for geolocation by providing physical sensor models for light detection and ranging (LIDAR) and sound navigation and ranging (SONAR), and it presented a more detailed set of elements for SAR. It also defined the metadata needed for aerial triangulation of airborne and spaceborne images.

OGC defined interfaces and encodings for sensor devices and data through sensor web enablement (SWE) to enable the sharing of sensor data over the Web. Sensor Model Language (SensorML) is one of the five defined, prototyped and tested implementation standards under SWE activity. Its primary focus is to provide a robust and semantically-tied means to define processes and processing components associated with the measurement and post-measurement transformation of observations. It utilizes the process concept to describe sensors, systems, and processes surrounding observations and measurements. Geolocation is one of those processes.

Since ISO 19130-1 and ISO/TS 19130-2do not define encoding rules, the actual implementation of image sensor models for geopositioning can vary based on the interpretation of image producers. To facilitate the standardization of implementations, this document utilizes the Extensible Markup Language (XML) schema defined in OGC SensorML to provide XML Schema encodings for the imagery sensor models for geopositioning defined in ISO 19130-1 and ISO/TS 19130-2. It enables both semantic and syntactic interoperability between ISO 19130-1, ISO/TS 19130-2and OGC SensorML.

The name and contact information of the Maintenance Agency for this document can be found at www.iso.org/maintenance_agencies.

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Geographic information — Imagery sensor models for geopositioning —

Part 3: Implementation schema

1 Scope

This document defines the XML Schema implementation of imagery sensor geopositioning models defined in ISO 19130-1 and ISO/TS 19130-2. It applies XML Schema inheritance and extension based on the OGC SensorML and OGC SWE Common Data Model.

Instead of introducing an XML Schema based on the UML models defined in ISO 19130-1 and ISO/TS 19130-2, it leverages the existing OGC SensorML by first introducing a semantic mapping from the model elements defined in ISO 19130-1 and ISO/TS 19130-2 to OGC SensorML, and then defining the detailed schema inheritance and extensions based on OGC SensorML to fully support encoding of the imagery sensor models for geopositioning defined in ISO 19130-1 and ISO/TS 19130-2.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 19103, *Geographic information — Conceptual schema language*

ISO 19111, *Geographic information — Referencing by coordinates*

ISO 19115-1, *Geographic information — Metadata — Part 1: Fundamentals*

ISO 19115-2, *Geographic information — Metadata — Part 2: Extensions acquisition and processing*

ISO 19123-2, *Geographic information — Schema for coverage geometry and functions — Part 2: Coverage implementation schema*

ISO 19130-1, *Geographic information — Imagery sensor models for geopositioning — Part 1: Fundamentals*

ISO/TS 19130-2, *Geographic information — Imagery sensor models for geopositioning — Part 2: SAR, InSAR, lidar and sonar*

ISO 19157-2, *Geographic information — Data quality — Part 2: XML schema implemenation*

ISO/TS 19163-1, *Geographic information — Content components and encoding rules for imagery and gridded data — Part 1: Content model*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

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