LuciadFusion 2020.0

2 March 2020
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About This Release

The 2020.0 release of LuciadFusion focuses on the integration and processing of data. With this release, developers have a new set of capabilities to better serve their customers in need of data management and dissemination solutions in the defense, aviation, infrastructure, and Smart Cities application domains.

Figure 1: The Luciad product portfolio.
Benefits of the New Features

New Data Connectors

Add Significant Weather Data Encoded as BUFR

During flight planning, weather forecasts are an important factor. Significant weather (SIGWX) offers a high-level forecast for the presence of clouds, storms, volcano eruptions, turbulence, etc. New information is provided four times a day by one of the official World Aviation Forecast Centres.

LuciadFusion now supports SIGWX information encoded using the BUFR data format. This support includes visualization of various weather elements applying the standardized symbology. SIGWX data can be crawled, managed, and served via LuciadFusion Studio. Based on SIGWX data, a data manager can set up OGC Web Map Service (WMS), Web Map Tiling Service (WMTS) and Web Feature Service (WFS).

BUFR stands for Binary Universal Form for the Representation of meteorological data. It is a standard developed by the World Meteorological Organization (WMO).

This feature is available as part of the Weather and Environment option of LuciadFusion.

Add Topographic Maps from the Multinational Geospatial Co-production Program (MGCP)

The Multinational Geospatial Co-Production Program (MGCP) is a data production initiative. It is a DGIWG\(^1\) standard, designated to be the successor of the military VPF (Vector Product Format). The data contains topographic maps optimized for specific viewing scales (1:50,000 or 1:100,000).

MGCP data is stored in a simple vector format, like SHP, and the visualization is specified by MGCP portrayal rules. The data is organized in various information layers.

LuciadFusion now supports MGCP data. The data can be crawled, managed, and served using LuciadFusion Studio. Based on MGCP data, a data manager can set up OGC WMS and WMTS services. The portrayal rules will automatically be applied.

This feature is available as part of the Defense Standards option of LuciadFusion.

\(^1\) dgiwg.org/dgiwg/
Add CAD Data in the Hexagon Binz Format

LuciadFusion now also brings situational awareness to the infrastructure domain. The 2020.0 release offers support for the Hexagon Binz format. This format is used to store 3D infrastructure models and is optimized for progressive rendering of complex 3D structures with lots of visual detail.

The data can be crawled, managed, and served using LuciadFusion Studio. Based on Binz data, a data manager can set up OGC 3D Tiles services. A processing service is included that converts the Binz data into 3D tiles and caches those for optimal streaming performance. Offline processing of Binz data sets into OGC 3D Tiles can be set up via the API.

This feature is available as part of the Infrastructure Standards option of LuciadFusion Pro.
Prepare Your 3D Meshes for Streaming via Conversion to OGC 3D Tiles

3D models are widely used in a variety of industries, not least in the geospatial world. They are either captured through photographic surveying or created in design modeling tools or via a combination of automated and manual modeling. Highly detailed 3D reality meshes, generated to represent a precise real-world environment such as a building, a bridge, or even an entire city, are becoming increasingly popular sources of 3D models. They are typically massive in size.

For smooth visualization, even when connecting to a remote data source, 3D models are best streamed as a feed of 3D tiles. The Open Geospatial Consortium (OGC) has defined a community standard, OGC 3D Tiles. This is a multi-leveled 3D-tiled format for 3D mesh data. Luciad products already support the OGC 3D Tiles protocol for streaming 3D meshes.

In the ideal scenario, we can serve and consume optimally tiled and multi-leveled 3D tile datasets. In practice, however, datasets often do not meet ideal conditions. Factors influencing the quality are the tile generation process, data format, and data structure. When a non-optimally structured 3D tile dataset is encountered, the visualization performance will be suboptimal.

Various solutions exist on the market, but there is no solution that covers the variety of needs of customers of the Luciad product portfolio. Our customers reported the need to handle many different types of data:

- Datasets automatically created from photogrammetry/global matching/LiDAR
- Datasets based on a combination of imagery and cadastral parcel information, optionally combined with manually created 3D models
- CAD/BIM data

LuciadFusion 2020.0 addresses this need with a 3D Tiles processing engine that optimizes 3D mesh datasets for streaming.

The new 3D Tiles processing engine takes as input any data in OBJ format. It can handle various types of data, including CAD/BIM data. Plenty of tools exist to convert data into OBJ.

Making no assumptions on the structure of the data, the 3D Tiles processing engine will clean up data structures, split the data into tiles, combine them, and apply simplification to create of levels of detail. Texture atlases are created, and the result is encoded as an OGC 3D Tiles-compliant dataset.

The 3D Tiles processing engine is delivered as API, offering the possibility to set up offline data processing.

This feature is available as part of the Infrastructure Standards option of LuciadFusion Pro.
Figure 5: An OGC 3D Tiles service is pending while the 3D data is being processed.
Other Improvements

Support for the Krovak Projection
To better support our customers from the Czech Republic, LuciadFusion now supports the Krovak projection, a conic projection. With the introduction of this projection, the following additional EPSG codes are available: EPSG:2065, EPSG:5221, EPSG:5513, EPSG:5514, EPSG:8352, and EPSG:8353.

Figure 6: The Krovak projection and related EPSG codes have been added.

SLD/SE
LuciadFusion’s SLD/SE styling capabilities have been extended on the following aspects:

- You can now use functions inside SLD/SE Geometry and ParameterValue (such as rotation) elements. On top of the existing capability to use property names, this provides additional flexibility to customize styles. Related to this, support has been added for four new vendor-specific functions that operate on a geometry defined by a given property name:
  - StartAngle(PropertyName) and EndAngle(PropertyName): determine respectively the start and end angle of the referred geometry, measured in degrees clockwise from the direction at 12 o’clock.
  - StartPoint(PropertyName) and EndPoint(PropertyName): determine respectively the start and end point of the referred geometry.
An example use case combining these new capabilities is the configuration of an arrowhead at the end of a polyline. By using a point symbolizer with a geometry defined by the EndPoint of the polyline and a rotation defined by the EndAngle of the polyline, an oriented arrow icon can be drawn at the end of the polyline.

- You can now define a raster colormap using either a Categorize or Interpolate element. In the case of Categorize, a non-interpolated colormap can be defined, whereas the use of the Interpolate element results in an interpolated colormap.

Better Integration with Third-Party OGC Clients
LuciadFusion (V2019.1) now offers improved interoperability and added robustness when integrating with third-party OGC clients. This confirms our commitment to interoperability and open standards and is of particular interest to customers using LuciadFusion in combination with GeoMedia (part of the Power Portfolio), QGIS, or ArcGIS.

Product Packaging Change
LuciadFusion Pro has a new option, Infrastructure Standards, as illustrated in the table below. This option replaces the former CAD Connectors option, available with LuciadFusion Advanced and Pro until V2019.1. The Infrastructure Standards option is only available in LuciadFusion Pro. It offers the CAD connectors, in addition to support for the Hexagon Binz format and the 3D Tile processing engine.

When you are ready to upgrade, we will advise you on how your current configuration, including the CAD Connectors option, maps onto the 2020 options and tiers.
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Our technologies are shaping urban and production ecosystems to become increasingly connected and autonomous — ensuring a scalable, sustainable future.

Hexagon’s Geospatial division creates solutions that deliver a 5D smart digital reality with insight into what was, what is, what could be, what should be, and ultimately, what will be.

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