

LuciadRIA

Situational awareness in the browser



LuciadRIA is the answer to the growing demand for powerful, lightweight applications in the browser. Driven by technologies including Web Assembly, Javascript, Typescript, WebGL and HTML 5, LuciadRIA delivers desktop-like performance for your web applications.

Developers can create interactive C2 and location intelligence applications thanks to the clean design, modular structure and powerful visual analytics capabilities that can be plugged in. Using its configurable API, you can add support for custom data feeds, add your own symbology or match user interaction and look and feel to your company's needs and style. LuciadRIA offers a single visualization API for 2D and 3D.

With Hexagon's browser solution, you can expect high performance and accurate visualization of of all types of 2D information, as well as 3D data and dynamic content, such as tracks and 360-degree panoramas. Connect to your data via OGC web services or drag and drop common file formats. Data can be explored in a 2D or 3D map view or vertical intersection view. Combine with a timeline view for 4D analysis.

Who needs the LuciadRIA browser solution?

These are just a few examples of why users turn to LuciadRIA for their geospatial data challenges:

- Build a mission-critical, web-based solution that handles geospatial data with the accuracy required for mission planning
- Build a standards-based, interoperable, web-based solution that handles 2D and 3D
- Work with defense symbology, including MS2525 and APP6, in a browser application
- Visually analyze millions of events or locations
- Handle real-time dynamic data, such as flights, vessels or people with tens of thousands of moving assets
- Perform client-side analytics with the interactivity of a desktop solution
- Bring in 3D data like point clouds, 3D meshes and 360-degree panoramas in a single view, resulting in a high-quality and operationally relevant digital twin of your area of interest
- Work with data and maps in different projections (including 3D, but also 2D polar projections) without going through the process of extract-transform-load (ETL)

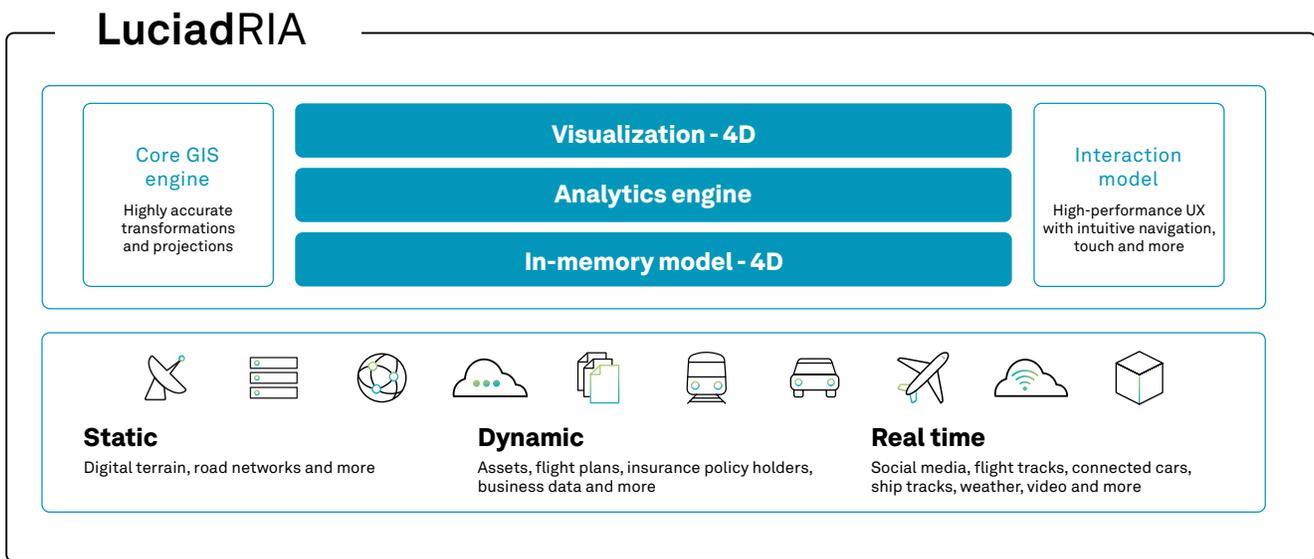


Figure 1 - LuciadRIA can connect to hundreds of data sources. The solution is compatible with HTML5, WebGL, Web Assembly, Typescript and Javascript.



Figure 2 - Add realism to your 3D scene by adding shading and shadow effects to your data. To try it out yourself; take a look at these [LuciadRIA samples](#).

Key benefits

Best-in-class performance	Enjoy an unprecedented user experience within an HTML 5-equipped browser; if your device supports WebGL and/or Web Assembly, this can be exploited for even better performance
High geospatial positioning accuracy	Visualize and interact with data with precision, even after transformation or reprojection; all geodetic calculations are performed on the client side
Desktop-like experience	Enjoy a desktop-like experience that includes visualization of imagery, feature data, 3D data and dynamic content, such as tracks or annotations
Builds on web standards	Use any HTML5-capable browser, including mobile browsers; delivered as EcmaScript6 (ES6) modules
Customizable	Easily develop browser-based user interfaces, edit content and make map annotations; a single API allows configuration for 2D software rendering and 2D and 3D WebGL-based rendering, depending on the target platform

Overview

The LuciadRIA components have been organized into product tiers. Depending on the needs of your organization, you can opt for LuciadRIA Essential or Pro. With the Pro tier, you can optionally add support for defense symbology.

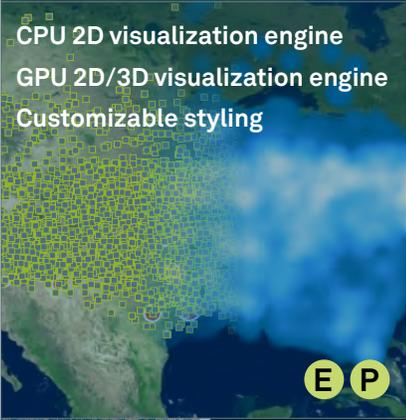
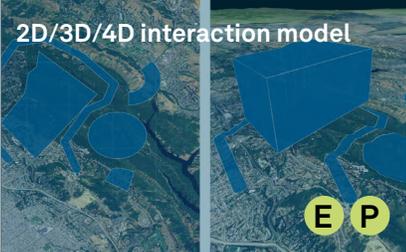
Legend

- Feature included
- Optional feature

Functionality	Essential	Pro
Core GIS engine	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Geospatial reference models	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Transformation and projection engine	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
4D cartesian and geodesic geometry model	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
CPU 2D vsualization engine	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
GPU 2D/3D visualization engine	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Customizable styling	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
2D/3D/4D interaction model	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Vertical, profile and timeline views	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Visual analytics	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Raster connectors	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Vector connectors	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Point clouds and reality meshes	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
OGC standards	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
360 panoramic imagery		<input checked="" type="checkbox"/>
Advanced GIS engine		<input checked="" type="checkbox"/>
Defense symbology		<input type="checkbox"/>

Functional specification

Below is a high-level, non-exhaustive overview of the functionality available in LuciadRIA. You can use the functionality it offers out of the box or extend it to meet user-specific requirements.

<p>Core GIS engine Geospatial reference models Transformation and projection engine</p> 	<ul style="list-style-type: none"> • Perform on-the-fly map transformations in the browser • Visualize data in any EPSG map projection; visualize accurate geodetic lines and warp raster data
<p>4D cartesian and geodesic geometry model</p> 	<ul style="list-style-type: none"> • Model any vector data • Load big data sets asynchronously • Represent complex geodetic object geometries with their metadata; supported geometries include points, polylines, polygons, circles, ellipses, circular arcs, elliptical arcs, circular arc bands and buffers • Benefit from support for static data, as well as dynamic data feeds
<p>CPU 2D visualization engine GPU 2D/3D visualization engine Customizable styling</p> 	<ul style="list-style-type: none"> • Visualize data in a multi-layered 2D or 3D view, and add a lon-lat grid • Apply flexible styling (2D and 3D icons, meshes, line styles, fill styles, transparency and video) to your data and customize it using the OGC-defined Styled Layer Descriptor/Symbology Encoding (SLD/SE) standards • Create versatile labels, with options for styling and decluttering • Benefit from integrated high-performance imagery rendering in the view, exploiting multileveling and tiling structures • Drape any data, including vector data and dynamic data, on terrain or 3D meshes • Apply lighting effects to realistically simulate light sources • Dynamically display thousands of moving tracks and generate interactive and dynamic heat maps
<p>2D/3D/4D interaction model</p> 	<ul style="list-style-type: none"> • Start off with a ready-to-use controller that includes standard controls (zoom, pan and select), freehand drawing and editing, multi-touch support (including Microsoft Pointer events and Gesture events) and snapping • Fine-tune navigation using the configurable 3D camera • Discover changes between two data sets with the swipe and flicker visual change detection controllers • Easily create other controllers for custom interaction
<p>Vertical, profile and timeline views</p> 	<ul style="list-style-type: none"> • Use cartesian views with the ability to display any kind of quantitative data (for example, altitudes, distances, speed values or time) • Configure these views with a reference that displays these quantities in a certain unit of measure (for example, flight level, meters and nautical miles) • Benefit from a wide range of customizing options for the annotation of the view axes; concrete examples of cartesian views are provided in the form of a vertical view and a timeline view

E Included in Essential **P** Included in Pro

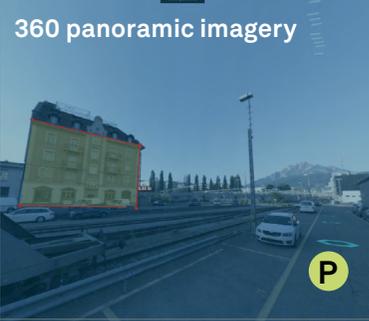
 <p>Visual analytics</p>  <p>E P</p>	<ul style="list-style-type: none"> • Rapidly gain a thorough understanding of your geospatial data using advanced visual analytics tools • Configure clustering algorithms to aggregate a multitude of data objects into easily distinguishable clusters based on their properties • Analyze trajectory information and plot information by applying filters and parameterized styles, or interactively and visually explore them simulated over time • Create heat maps based on static and dynamic data • Apply any expression to 3D meshes (for example, show cross-sections of buildings)
 <p>Raster connectors</p> <p>Vector connectors</p>  <p>E P</p>	<ul style="list-style-type: none"> • Access raster and vector data in a variety of formats • Raster data: <ul style="list-style-type: none"> • LuciadFusion Tile Service, Bing Maps, Google Maps, OGC WMS, OGC WMTS, HERE maps, Open Street Map • Direct support for georeferenced raster data • Vector data: <ul style="list-style-type: none"> • GeoJSON, gITF, GML, OGC WFS, KML
 <p>Point clouds and reality meshes</p> <p>E P</p>	<ul style="list-style-type: none"> • Connect to and visualize unlimited point clouds and reality meshes • Load 3D tiles optimally. Draco, CRN and WebP compression are supported • Style and filter point clouds and reality meshes • Apply shading, depth of field, PBR and shadow effects to 3D meshes • Add custom and dynamic metadata to 3D meshes data at runtime • Combine 3D data with terrain, other geodata, annotations and measurements • Drape vector data and imagery data over 3D meshes • Get support for: <ul style="list-style-type: none"> • OSGB, LAS, LAZ, E57, OGC 3D tiles, HSPC
 <p>OGC standards</p> <p>E P</p>	<ul style="list-style-type: none"> • Access data through OGC data exchange standards: <ul style="list-style-type: none"> • GML, KML, filter, simple features, symbology encoding (SE), WFS, WMS, WMTS, 3D tiles
 <p>360 panoramic imagery</p> <p>P</p>	<ul style="list-style-type: none"> • Connect to and visualize 360-degree panoramic image data sets • Integrate with other data sources in the 3D view • Load multiple panoramic data sets • Measure off the panoramic image • Combine with 3D data like terrain, 3D structures, meshes and point clouds for accurate positioning and realistic transitions • Get support for: <ul style="list-style-type: none"> • E57, Leica Pegasus • Add other formats via the LuciadFusion API
 <p>Advanced GIS engine</p> <p>P</p>	<ul style="list-style-type: none"> • Perform constructive geometry calculations on the client side • Create and visualize the union, intersection and difference between (sets of) shapes
 <p>Defense symbology</p> <p>P</p>	<ul style="list-style-type: none"> • Create, visualize and edit all unit symbols and tactical graphics from military standards on the client side, with configurable and customizable symbol styling and graphics stroking; embedded look-up for the specification of tactical graphics • Access dynamic display of a labeled MGRS grid, including support for MGRS references • Symbology standards: <ul style="list-style-type: none"> • APP-6A, APP-6B, APP-6C, APP-6D, MS2525b, MS2525c, MS2525d



Figure 3 - Visually comparing layers with the swipe controller

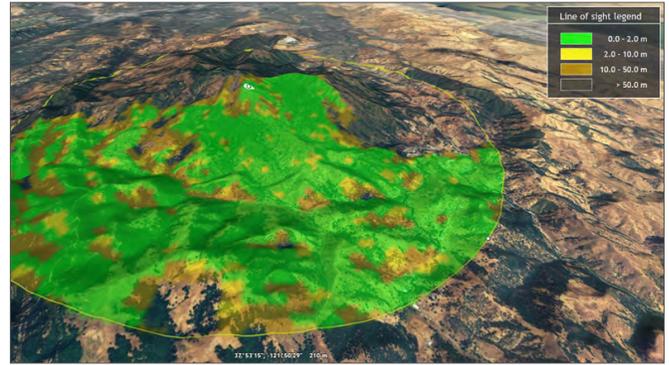


Figure 4 - Streaming and visualizing high-resolution terrain with the result of an LOS calculation draped over the terrain

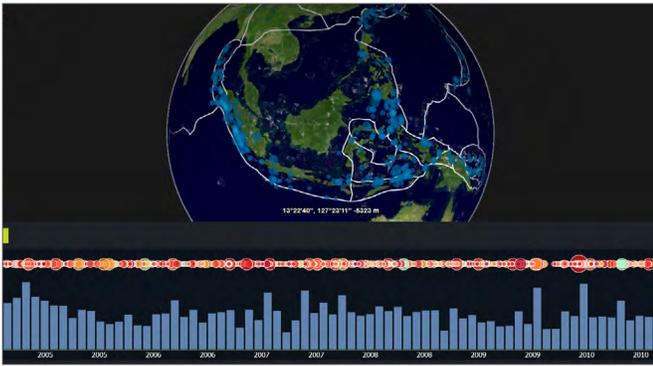


Figure 5 - Visualizing the density of earthquake events with time filtering

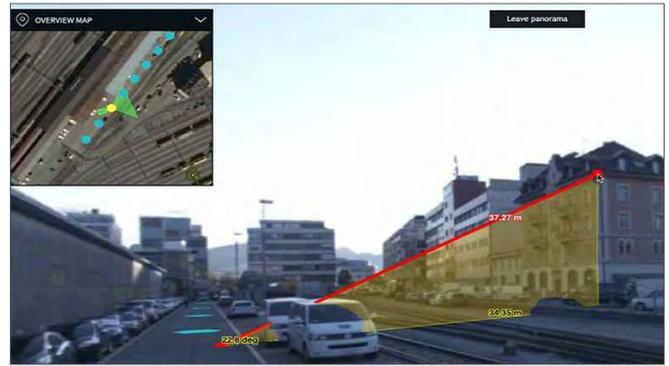


Figure 6 - Performing accurate measurements of 3D imagery



Figure 7 - Model, visualize, edit and create military icons and tactical graphics



Figure 8 - Monitor editable building information through selection and expression-based styling on 3D data



Figure 9 - Attract the user's attention by using bloom effects to highlight airspaces

More information

LuciadRIA requires:

- HTML5-capable browser
- For 3D visualization and advanced visual analytics, support for WebGL and Web Assembly are a prerequisite

LuciadRIA comes with:

- Code samples for all components, running live on dev.luciad.com
- A convenient sample launcher
- Developer guides with clear explanations, how-to guides and descriptions of best practices
- API reference offering detailed description of all interfaces and classes
- Release notes to see what's new
- Technical notes describing technical requirements and device support reporting tool
- A declaration file and instructions for TypeScript development

To learn more or schedule a demo, contact us at info.luciad.gsp@hexagon.com.

For developer guides, code snippets, technical articles, videos and more, visit the [Luciad Developer Platform](#).



Hexagon is a global leader in digital reality solutions, combining sensor, software and autonomous technologies. We are putting data to work to boost efficiency, productivity, quality and safety across industrial, manufacturing, infrastructure, public sector, and mobility applications. Our technologies are shaping production and people-related ecosystems to become increasingly connected and autonomous – ensuring a scalable, sustainable future.

Hexagon's Safety, Infrastructure & Geospatial division improves the resilience and sustainability of the world's critical services and infrastructure. Our solutions turn complex data about people, places and assets into meaningful information and capabilities for better, faster decision-making in public safety, utilities, defense, transportation and government. Learn more at hexagon.com and follow us [@HexagonAB](https://twitter.com/HexagonAB).