isBIM | JARVIS

JARVIS AI GIS

JARVIS 智慧地理空间信息平台

Unifying GIS, BIM, Satellite, Point Cloud, and AI Copilot in a Single Spatial Decision Hub.

一站式融合 GIS、BIM、卫星图与 AI 助手，打造无缝的空间智能决策中心。

Executive summary

执行摘要

JARVIS AI GIS is an enterprise-grade, web-based GeoBIM platform that unifies Geographic Information Systems (GIS), Building Information Modeling (BIM), satellite imagery, vector maps, terrain, photogrammetry, point clouds, and 3D city/building models into a seamlessly integrated spatial environment. Powered by an advanced AI Copilot, open-source architecture, and universal data integration engines, JARVIS AI GIS enables multi-scale visualization, spatial analysis, and AI-assisted existing-condition modeling for urban planning, engineering, and asset lifecycle management.

JARVIS AI GIS 是基于 Web 构建的下一代开源 GeoBIM（GeoBIM：地图与建筑模型融合一体化系统） 空间智能平台。平台可在统一的三维空间环境中无缝融合地理信息系统(GIS)、建筑信息模型 (BIM)、卫星影像、矢量地图、高程地形、倾斜摄影、激光点云及三维城市/建筑模型。通过融入强大的 AI Copilot 对话式助手、完全开源解耦的架构以及全源数据集成引擎，实现多尺度可视化、高级空间分析以及人工智能辅助现状建模，全面赋能城市规划、工程建设与信息化资产运营。

100%	AI	100%	5
Open Source 完全开源与自主可控	**Interactive Copilot** 自然语言对话智能	**Browser-Based Access** 纯浏览器访问	**Analysis Engines** 分析引擎

CORE VALUE PROPOSITIONS 三大核心卖点

Value Pillar 核心卖点	English Description	中文说明
1.Open Source& Data Sovereignty **1.完全开源与自主可控**	The modular open architecture eliminates exclusive software binding. Users can deploy the platform on private servers and carry out customized secondary development to realize full control of internal spatial data.	平台采用模块化开源架构，无商业软件绑定限制。支持私有化本地部署与深度定制开发，实现单位内部空间数据全流程自主管控。
2.Universal Integration **2.全系统与全源集成**	The platform is compatible with geographic files, engineering CAD drawings, building models, laser point clouds and real-time IoT streaming data. It supports bidirectional data interconnection with asset management and ERP systems, automatically completing format conversion and coordinate alignment, which saves a large amount of repetitive manual data sorting work and breaks cross-departmental data barriers.	平台兼容地理文件、工程 CAD 图纸、建筑模型、激光点云、物联网实时数据流，可与资产管理、企业资源管理系统双向互通。系统自动完成文件转译、坐标统一对齐，节省大量重复性人工整理工作，彻底打通各部门数据孤岛。
3.AI Copilot Engine **3.AI Copilot 对话协同**	The context-sensitive conversational AI converts complicated spatial query, layer management and geometric calculation into simple Chinese and English text commands. Ordinary planners and construction staff can complete professional analysis independently without mastering complex software operation steps.	搭载具备上下文感知能力的对话 AI，将复杂空间检索、图层调度、几何测算转化为简易中英文文字指令。规划、施工普通工作人员无需掌握繁杂软件操作步骤，即可独立完成各类专业分析工作。

1. Industry Pain Points & Core Premise

1. 行业痛点与核心前提

Traditional spatial data management faces structural bottlenecks. Planners and engineers are forced to navigate between disconnected software environments, losing critical data during the transition from macro-planning (GIS) to micro-engineering (BIM).

传统的空间数据管理面临结构性瓶颈。规划师与工程师被迫在相互割裂的软件环境中切换，在从宏观规划 (GIS) 到微观工程 (BIM) 的过渡中遗失关键数据。

Challenge 行业挑战	What it means in practice 实务含义
Data silos across disciplines **跨专业数据孤岛割裂**	GIS map data and BIM building models exist as two independent sets of information without automatic matching. Planners' land layout maps cannot align with pipeline models manually, which frequently causes pipeline-building collision faults during construction and brings additional rework cost. GIS 地理底图与 BIM 建筑模型分属两套独立数据，无法自动匹配对齐。规划出具的地块图纸，需人工与管线模型适配，极易在施工阶段出现管线与建筑碰撞问题，产生额外返工成本。
Proprietary Software Lock-in **商用软件封闭、使用成本高**	Conventional desktop GIS and BIM software adopt closed file formats and charge annual licensing fees. All participants need to install dedicated software to view 3D files, which raises cross-department communication and review costs significantly. 传统桌面端地理、建模软件文件格式封闭，且按年度收取授权费用。所有参与人员必须安装专属软件才能打开三维文件，大幅抬高跨部门沟通、方案评审成本。
High Professional Operation Threshold **空间分析操作专业门槛高**	Sightline simulation, earthwork volume calculation, building space collision inspection and other spatial computing functions require staff with professional GIS training to operate, and the operation process is complicated with multiple steps. 视域仿真、土方工程量核算、建筑空间碰撞校验等空间计算功能，需具备 GIS 专业培训背景的人员操作，操作流程步骤繁琐。
Heavy Manual Work for On-site 3D Modeling **实景三维建模人工工作量巨大**	Original data collected by drones and laser scanning only contains surface graphics without structural classification information. Converting such raw data into standard usable building models requires a large amount of manual drawing and sorting work. 无人机、激光扫描采集的原始实景数据仅包含表面图形，无构件分类信息，将原始数据转化为标准可用建筑模型需投入大量人工绘图整理工作。

Core Premise for GIS Adoption AI GIS 落地核心前提

JARVIS AI GIS is built on three principles: (1)The unified spatial system connects rather than replaces existing enterprise software. Users do not need to discard original GIS and BIM tools, which avoids large-scale system replacement procurement expenditure ; (2) AI serves as auxiliary support instead of replacing manual professional judgment. All AI measurement and detection results carry confidence scores and complete source records, which can pass all government audit inspections and prevent economic losses caused by misjudgment; (3)The platform runs fully on standard browsers without client installation. All project participants including planners, site engineers and supervisors can access unified, consistent spatial data through web links anytime. .

JARVIS AI GIS 的设计遵循三大核心准则：（1）统一空间系统对接企业现有软件而非直接替代，用户无需淘汰正在使用的 GIS、BIM 工具，避免大规模更换系统带来的采购支出；（2）人工智能仅作为辅助工具，不替代人工专业研判。平台所有 AI 测算、检测结果均标注置信度与完整数据源，可完整通过政务各类审计核查，规避误判带来的经济损失；（3）平台完全依托普通浏览器运行，无需安装客户端。规划人员、现场工程师、监理等全部项目参与人员，均可通过网页链接随时调取统一、无偏差的空间数据。

✗ Traditional Approach 传统模式

- Manual format & coordinate conversion, prone to errors
- Only works on high-end desktops; web 3D rendering lags
- Separate GIS and BIM systems, no data linkage
- 数据格式、坐标依靠人工转换校准，易产生偏差
- 仅适配高性能台式电脑，网页端加载大型三维场景卡顿
- 地理系统、建筑建模系统相互独立，数据无法联动复用

✔ JARVIS AI GIS Approach 本平台模式

- Bowser-based multi-scale 3D view, no local client
- One-click spatial analysis via natural language
- Open modular design, extendable and system-integrable
- 纯浏览器加载多尺度三维场景，无需安装本地客户端
- 通过自然语言指令一键执行各类专业空间分析计算
- 开源模块化架构，可按需拓展功能、对接各类业务系统

2. What JARVIS AI GIS Is

2. 平台介绍

JARVIS AI GIS is a web-based GeoBIM platform running above existing GIS, BIM and collaborative data systems. It collects scattered spatial data into one consistent 2D and 3D environment and adds AI automatic analysis capacity on top without replacing original business software. Users can overlay geographically calibrated BIM models on satellite terrain, measure distance, area and volume directly in browsers, compare design drawings with on-site survey data, and run daylight simulation without any professional desktop software installation.

JARVIS AI GIS 是网页式 GeoBIM 平台，运行于企业现有 GIS、BIM 协同系统上层。平台将分散的各类空间数据归集至统一二三维环境，并在原有系统基础上叠加 AI 自动分析能力，无需替换原有业务软件。用户可将带地理坐标的 BIM 模型叠加至卫星地形之上，直接在浏览器测量距离、面积、土方体积，对比设计图纸与现场勘测数据，开展日照仿真，全程无需安装专业桌面软件。

AI Capability AI 能力	What it does 功能说明
Object Detection **构件目标识别**	The system automatically identifies buildings, roads, vegetation, pipelines and equipment from satellite, aerial and point cloud data, which eliminates manual marking work of ground features and speeds up site condition sorting. 系统依托卫星、航拍、点云数据自动识别建筑、道路、植被、管线、设备，省去人工地物标注工作，加快现场情况整理效率。
Terrain Classification **地形分类**	AI automatically divides terrain into construction area, vegetation, water and bare land, and calculates corresponding area and volume data in one step, simplifying manual terrain statistical work. 人工智能自动将地形划分为建成区、植被、水体、裸土，并一步算出对应面积、方量数据，简化人工地形统计工作。
Shadow & Daylight Simulation **日照与阴影模拟**	The platform calculates real solar tracks of any date and time to generate accurate shadow analysis results, which directly supports planning compliance review and environmental impact evaluation without repeated manual calculation. 平台演算任意日期、时段的真实太阳轨迹，输出精准日照阴影分析成果，直接用于规划合规评审、环境影响评估，无需人工反复测算。
Existing-Condition Modelling **现状模型生成**	The platform generates complete 3D on-site models automatically based on 360° panorama, aerial photography and laser point cloud data. The whole process shortens manual modeling work from dozens of days to several hours and greatly cuts labor cost for survey teams. 平台依托 360° 全景、航拍、激光点云数据自动生成完整三维现场模型，将原本数十天的人工建模工作压缩至数小时完成，大幅缩减勘测团队人力成本。
Conversational Spatial Query **对话式空间查询**	Users input simple Chinese or English questions to extract target spatial data from the whole project database, such as "show all drainage pipelines within 50 meters of the building boundary", which lowers the operation threshold for non-technical staff. 用户输入简易中英文问句，即可从完整项目数据库提取目标空间数据，例如 “展示建筑红线 50 米范围内全部排水管线”，降低非技术人员操作门槛。

Four Integrated Subsystems　四个集成子系统

The platform consists of four coordinated subsystems: GeoBIM ontology & knowledge graph layer (knowledge graph = associated database linking all maps, buildings and sensors to trace data source with one click), automatic data import & coordinate engine, AI multi-function analysis engine, and standardized result output layer supporting full-cycle project delivery. All data completes import and sorting through automatic pipelines without manual entry.

平台由四大协同子系统构成：GeoBIM 本体与知识图谱层（知识图谱：关联全部地图、建筑、传感信息的数据库，一键追溯数据原始来源）、自动数据接入与坐标引擎、多功能 AI 分析引擎、支撑项目全周期交付的标准化成果输出层。全部数据通过自动化通道完成导入整理，无需人工录入。

3. AI COPILOT: THE INTELLIGENT ASSISTANT

3. AI COPILOT 空间智能助手

The JARVIS AI Copilot transforms complex spatial operations into standard natural language conversations in English or Chinese. It operates as a contextual co-pilot alongside the engineer or city planner.

JARVIS AI Copilot 将复杂的专业空间操作转化为平实的自然语言对话（支持中英文）。作为规划师与工程师的空间智能助手，随时随地提供上下文感知的分析支持。

What Users Can Ask AI Copilot | 典型自然语言提问示例

- **"Show all building models within 50m of the bridge project that exceed 30m in height."**

  “显示桥梁工程周边 50 米范围内所有高度超过 30 米的建筑模型。”

- **"Calculate the total cut and fill volume for the proposed residential zone on current terrain."**

  “计算当前拟建住宅区在现有地形上的总开挖量与回填量方数。”

- **"Check if the new tower design blocks daylight to neighboring school buildings for more than 2 hours."**

  “核查新建塔楼设计方案是否会导致邻近学校建筑连续阴影遮挡超过 2 小时。”

- **"Highlight all underground utility pipelines with high maintenance risk based on IoT sensor data."**

  “根据物联网传感器实时数据，高亮高风险的地下管线区域。”

THE 6 SPECIALIZED GEO-AGENTS BEHIND COPILOT　支撑 COPILOT 的六大专业 AGENT

Agent 智能体	Role&Functions	职责与功能
1. Geo-Data Agent 空间数据智能体	Retrieves and loads relevant GIS layers, BIMmodels, and point cloud files based on user prompts.	根据用户对话指令，快速检索并调度加载对应的 GIS 图层、BIM 模型与点云文件。
2. Spatial Analytics Agent 空间分析智能体	Executes geometric calculations including buffer zones, slope analysis, viewshed, and volumetric math.	自动执行几何拓扑计算，包括缓冲区分析、坡度分析、视域开阔度及土方体积计算。
3. Compliance Agent 规划合规智能体	Cross-checks spatial parameters against urban planning codes, setback rules, and height restrictions.	对照城市规划控制性指标（如退界线、容积率、限高及绿化率）进行自动化空间合规审查。
4. As-Built AI Agent 现状建模智能体	Drives automated mesh segmentation, feature extraction, and point cloud vectorization workflows.	驱动自动化网格分割、特征点提取以及激光点云矢量化三维重建作业。
5. IoT Fusion Agent 物联网融合智能体	Connects live sensor telemetry to 3D spatial objects, generating dynamic heatmaps and status alerts.	将实时传感器数据映射挂载至三维空间实体，生成动态热力图与异常风险预警。
6. Reporting Agent 报告生成智能体	Compiles interactive 3D spatial analysis results into exportable PDF reports and executive dashboards.	将交互式三维空间分析结果、图表与截图汇总导出为符合公文标准的专业 PDF 报告。

4. Embedded Business Logic

4. 内嵌式业务逻辑

JARVIS AI GIS embeds a defined set of business rules that govern how spatial analyses are run, how AI outputs are flagged, and how results are routed for review. These rules are configurable per project but follow a consistent baseline logic.

JARVIS AI GIS 内嵌成套标准化业务规则，管控空间分析的运行方式、AI 输出的异常标记方式、以及结果的复核分发流程。各类规则支持按项目自定义配置，同时共用一套统一的基础逻辑。

Rule 规则	Logic applied 逻辑说明
No auto-approval **禁止自动审批**	AI flags detections and anomalies for human review; AI does not automatically approve design changes, site modifications or survey results. AI 仅标记检测与异常，交由人工审核；系统不会自动审批设计变更、场地修改或勘测结果。
Full traceability **全程可溯源**	Every measurement, analysis result and AI detection is traceable to its source data layer, coordinate reference system and confidence level. 每一项量测、分析结果与 AI 检测均可溯源至其源数据层、坐标参考系统与置信水平。
Coordinate system validation **坐标系校验**	All data layers are validated against the project CRS before analysis; mismatched layers are flagged and re-projected only with confirmation. 所有数据层在分析前均对照项目坐标系统进行校验；不匹配的图层予以标记，仅在确认后重新投影。
Confidence thresholds **置信度阈值**	Low-confidence AI detections are routed to manual verification; high-confidence results are presented with the score visible for transparency. 低置信度 AI 检测结果转交人工复核；高置信度结果展示时标注分数，保持透明。
Role-based access **基于角色的权限**	Access to spatial data, measurement tools and analysis results is governed by role-based access control aligned with departmental procurement roles. 空间数据、量测工具与分析结果的访问权限依据 RBAC 分级管控，与部门采购角色对齐。
Model flexibility **模型可切换**	The underlying foundation model is configurable and can be switched between DeepSeek, Qwen, GPT and Gemini without changing the business logic layer. 底层基础模型支持自定义配置，可在 DeepSeek、Qwen、GPT、Gemini 之间切换，平台上层业务逻辑层无需改动。

5.CORE PLATFORM DELIVERABLES

5. 平台标准交付成果

JARVIS AI GIS produces standardized, multi-format spatial deliverables for project teams, government agencies, and decision- makers, ensuring seamless interoperability across the project lifecycle.

JARVIS AI GIS 为项目团队、政府监管部门及决策者生成标准化、多格式的地理空间交付成果，确保项目全生命周期的无缝协作

Deliverable 交付成果	Contents 内容	Used by 使用者
GeoBIM Project Map **GeoBIM 项目地图**	Unified 2D/3D map with all project data layers — BIM, GIS, terrain, imagery — accessible via browser. 统一二维/三维地图，涵盖所有项目数据层——BIM、GIS、地形、影像——可通过浏览器访问。	All project stakeholders 全体项目干系人
Spatial Analysis Report **空间分析报告**	Shadow, daylight, visibility, cut-and-fill and other spatial studies with methodology, results and source citations. 阴影、日照、可视域、土方量及其他空间研究，附方法论、结果与来源引用。	Planning & design teams 规划与设计团队
Existing-Condition Model **现状模型**	AI-assisted 3D existing-condition model derived from survey data, point clouds and 360° imagery. 基于勘测数据、点云与全景影像，AI 辅助生成的三维现状模型。	Design & survey teams 设计与勘测团队
Change Detection Log **变化检测日志**	Record of site changes detected between multi-temporal surveys, with before/after imagery and quantification. 多期勘测之间检测到的场地变化记录，附前后对比影像与量化数据。	Construction supervision 施工监理
Asset Spatial Register **资产空间台账**	Consolidated asset register with geospatial coordinates, footprints and spatial relationships to surrounding features. 综合资产台账，附地理坐标、占地范围及与周边要素的空间关系。	Asset management 资产管理部门
Audit-Ready Data Trail **审计数据轨迹**	Complete audit trail of every measurement, analysis and AI detection — with source data, method, confidence and reviewer. 每一项量测、分析与 AI 检测的完整审计追踪——附源数据、方法、置信度与复核人。	Audit & governance 审计与管控部门
Ask-anything Workspace **有问必答工作区**	Live query access to the full spatial dataset in English or Chinese, every answer source-linked. 以中文或英文实时查询全套空间数据集，每一回答均链接源数据。	All authorised users 所有获授权用户

DELIVERABLES VALUE: OPERATIONAL SUBTRACTION 交付价值：重塑工作流，做“减法”

Subtracting Operational Friction: The primary goal of JARVIS AI GIS deliverables is to eliminate unnecessary manual work. Fewer hours spent manually converting spatial formats; fewer technical barriers between non-GIS managers and spatial insights; zero expensive software licenses required for stakeholders to view complex 3D engineering models.

消除冗余，释放价值： JARVIS AI GIS 交付成果的核心价值在于“做减法”。大幅减少格式转换与坐标重对齐的人工耗时；打破非专业管理人员与空间数据之间的专业壁垒；项目干系人无需购买昂贵软件许可证，即可在浏览器端审阅复杂的三维工程模型。

6. Full Lifecycle Process

6. 全生命周期流程

JARVIS AI GIS supports the built asset across six stages, from early planning through handover and into long-term facilities management.

JARVIS AI GIS 为建筑资产提供全周期支撑，完整覆盖六大阶段，从前期规划、工程交付，一直延伸至长期设施运维管理。

Stage 阶段	What happens 执行内容
1. Planning & Feasibility **1. 规划与可行性研究**	Site selection, constraint mapping, environmental overlay analysis, preliminary shadow and daylight studies. 选址、约束条件制图、环境叠加分析、初步阴影与日照研究。
2. Design Development **2. 设计深化**	BIM model georeferencing, design option comparison, terrain integration, visibility and line-of-sight analysis. BIM 模型地理配准、设计方案比选、地形整合、可视域与视通分析。
3. Tender & Procurement **3. 招标与采购**	Spatial scope verification, existing-condition model handover, cut-and-fill and earthwork quantification. 空间范围核验、现状模型移交、土方量与开挖回填量化。
4. Construction Monitoring **4. 施工监测**	Progress tracking via UAV and satellite imagery, change detection against schedule, as-built vs. design comparison. 通过无人机与卫星影像追踪进度、对照进度计划进行变化检测、竣工与设计比对。
5. Handover & DLP **5. 交付与缺陷责任期**	As-built GeoBIM model handover, defect spatial mapping, DLP tracking with geotagged records. 竣工 GeoBIM 模型移交、缺陷空间定位、带地理标记记录的 DLP 追踪。
6. Operations & FM **6. 运营与设施管理**	Asset spatial register, remote inspection via 360° imagery, predictive maintenance with spatial context, ESG benchmarking. 资产空间台账、全景影像远程巡检、带空间上下文的预测性运维、ESG 对标评估。

7.1 Core Value 核心价值

One Spatial Truth	Faster Analysis	Full Traceability	System Integration
统一空间真相	**分析提速**	**全程可溯源**	**系统无缝集成**
Consolidates fragmented BIM, GIS, survey and reality data into a single auditable spatial record.	Spatial studies that took weeks now complete in hours — without specialist software.	Every measurement and AI detection carries source-data, CRS and confidence-level citations.	Works with existing GIS, BIM and CDE systems — no replacement required, no vendor lock-in.

7.2 Application Scope 适用领域

Capital works projects, transport infrastructure, water and drainage networks, public building portfolios, urban planning districts, environmental protection facilities, and large-scale site developments — scalable from a single building to a department's entire capital works pipeline.

基本工程项目、交通基础设施、水务与排水管网、公共建筑群、城市规划片区、环境保护设施、大型场地开发——并可由单一建筑扩展至整个部门的基本工程全流程。

Urban Planning & Design

Master planning, site suitability analysis, skyline shadow simulation, and regulatory zoning compliance.

城市规划与总体设计

总体规划审阅、用地选址适宜性分析、天际线日照遮挡模拟及控制性详细规划合规审查。

Infrastructure Construction

Highways, railways, bridges, tunnels, cut-and-fill optimization, and progress tracking against point clouds.

大型基础设施建设工程

公路、铁路、桥梁、隧道工程中的土方平整优化，以及无人机点云与 BIM 施工进度对比。

City Information Modeling (CIM) & Smart Facilities Management

Serving as the unified digital twin base for smart parks, airport hubs, and underground utility management with live IoT telemetry.

城市信息模型 (CIM) 与智慧园区设施管理

作为智慧园区、机场枢纽及地下综合管网的核心数字孪生底座，实现空间资产与物联网态势实时联动。

JARVIS AI GIS does not aim to replace your existing enterprise systems; it seamlessly unifies them. By placing spatial intelligence and AI Copilot at the center, it connects raw geographic measurements to real-world operational decision-making.

JARVIS AI GIS 绝非为了替代您现有的企业级系统，而是将它们无缝融通。以空间智能与 AI Copilot 为核心，将原始地理测量数据转化为驱动现实世界科学决策的引擎。

Figures are illustrative of platform scale across deployments; actual configuration varies by project and site. This document is for information only and does not constitute an offer. 上述数据反映平台整体部署规模，实际配置因项目及现场情况而异。本文件仅供参考，不构成要约。

Clause and standard references follow the form of contract and the departmental standards in use on the project concerned; the checking item set is configured accordingly at setup. Performance figures reflect the deployment described and vary with document quality, project size and configuration.

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