An innovative AEC/GIS integration platform that can service millions of 3D objects on a web browser!

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1st: Mechanization, water power, steam power
2nd: Mass production, assembly line, electricity
3rd: Computer and automation
4th: Cyber Physical Systems
Geospatial Paradigm Shift

Concept
- Object Information
- Consumer
- Person
- Real World
- Base Map
- Public Sector
- Outdoor
- Static

Data
- Context Awareness
- Prosumer/DIY
- Things
- Digital Twins
- Key Factor for Fusion
- Private Sector
- Indoor + Outdoor +
- Dynamic

User

Visualization

Application

Driving Entity

Space

Update Cycle

Source: Hosang Sagong (2016), ‘Policy Directions of Spatial Information for Hyper-connected Society’ modified>
3D GIS
A system designed for acquisition, storing, processing, analysis, management, or publishing of geospatial data in 3D environment
**BIM/AEC**

A digitalized design data of construction, infrastructure, or large-sized facilities/machineries under CAD(Computer Aided Design) environment
3D GIS + BIM = ?
From Standard,
Ready to make anything, anywhere

A new collaboration between Autodesk and Esri will put GIS and BIM at the center of construction projects, driving smarter decisions, optimized designs, accelerated project approvals, reduced cost, creating smarter cities and resilient infrastructure. Building the bridge between GIS and BIM will change the way we plan, design, and build our future.
And From Open Source...
Web Based Open Source GeoBIM!
mago3D = GIS + BIM + Open Source
mago3D is a platform for ...

1. Visualizing massive and complex 3D objects including BIM on a web browser

2. Seamless integration of BIM/AEC and 3D GIS in a single space

3. 'Digital Twin' that can create parallel worlds in a virtual reality with numerous IoT, sensor data

4. Web based collaborative issue/process management
Overall System Architecture

Client
- chrome
- Firefox
- Internet Explorer

Internet

Web Server
- NGINX
- Apache Tomcat
- GeoServer
- PostGIS

WAS
- Apache Tomcat

Content Management
- Cesium / World Wind
- F4DStorage

Database
- PostgreSQL

F4D Converter
- IFC
- 3DS
- OBJ
- COLLADA

2 main cores of mago3D
2 Main Cores of mago3D...

**F4D Converter**

F4D Converter converts 3D formats (IFC, 3DS, OBJ, DAE, JT) to 3D internet service format F4D. It carries out data size reducing and pre-processing for fast rendering.

**mago3D.js**

JavaScript that expands existing WebGL Globe’s features to support BIM and indoor space.

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Service HTML

API

mago3D.js

API

3D GIS Engines

Cesium.js

WebWorldWind.js
mago3D runs on any device
BIM Integration

Seamless integration of BIM and 3D GIS on the same platform

Scene from indoor to outdoor through windows

Scene from outdoor to indoor through windows
Integration of large size MEP and 3D GIS on a web browser
AEC Integration

Integration of large size AEC and 3D GIS on a web browser
Cultural Heritage in Korea
Tunnel, Bridge in Japan

Tunnel, Department store, Bridge, Overpass offered by CUG(Civil User Group) in Japan
OpenAPIs

APIs are supported for developing application systems (currently 29 APIs)

- moving objects & viewing attributes
- registration/monitoring/search of issues
Geospatial Context Matters!

→ mago3D can handle all the 3D objects in geospatial context
Real Case

- **Project Name:** Ship Building Process Management System
- **3D Models in Service**

![All Facilities & Blocks in 3D](image)

Virtual Yard on Web Browser!

- Factories: 75 EA
- Cranes: 250 EA
- Ships: 25 EA
- Blocks: 1,500 EA
- Office Buildings: 25 EA
- Docks: 3 EA
- Smart Welding Machine: 15,000 EA
- Yards: 1,700 EA

**Visualizing 1.2TB 3D**

**3D Models in Service:**

- Factories
- Cranes
- Ships
- Blocks
- Office Buildings
- Docks
- Smart Welding Machine
- Yards

*Virtual Yard on Web Browser!*
Real Case
Future Plan

- Public Cloud Service
- Participatory System
- Supporting More 3D Formats
- Improved CMS, OpenAPI, Statistics/Analytics

To the Digital Twin Platform
http://www.mago3d.com
Source Code

https://github.com/gaia3d
In Summary

• mago3D is a web based 3D objects visualization and management platform that can integrate BIM/AEC and GIS.

• It can visualize massive and complex 3D objects including BIM on a web browser without installing additional program or plugins.

• It utilizes open source WebGL Globe - Cesium, World Wind or others to expand those features and functions to indoor level.

• mago3D itself is a open source project with Apache and AGPL licenses.

• It supports many industry standard formats such as ifc, 3ds, obj, dae, kml, gltf...
For more information, please visit http://mago3d.com
All the source codes are available at https://github.com/gaia3d

Thank you!

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