

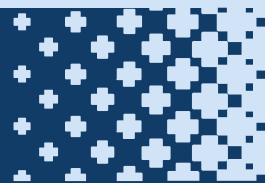


GIS NEWSLETTER

April 2023



مجموعة مايكروسنتر
MICROCENTER GROUP





WELCOME TO THE FUTURE OF GIS

Join us in San Diego to learn, reconnect, and take a deep dive into the latest advances in geographic information system (GIS) technology. Get a front-row seat to explore the future of GIS capabilities and discover the innovative ways it's being used to create a more sustainable and resilient world.

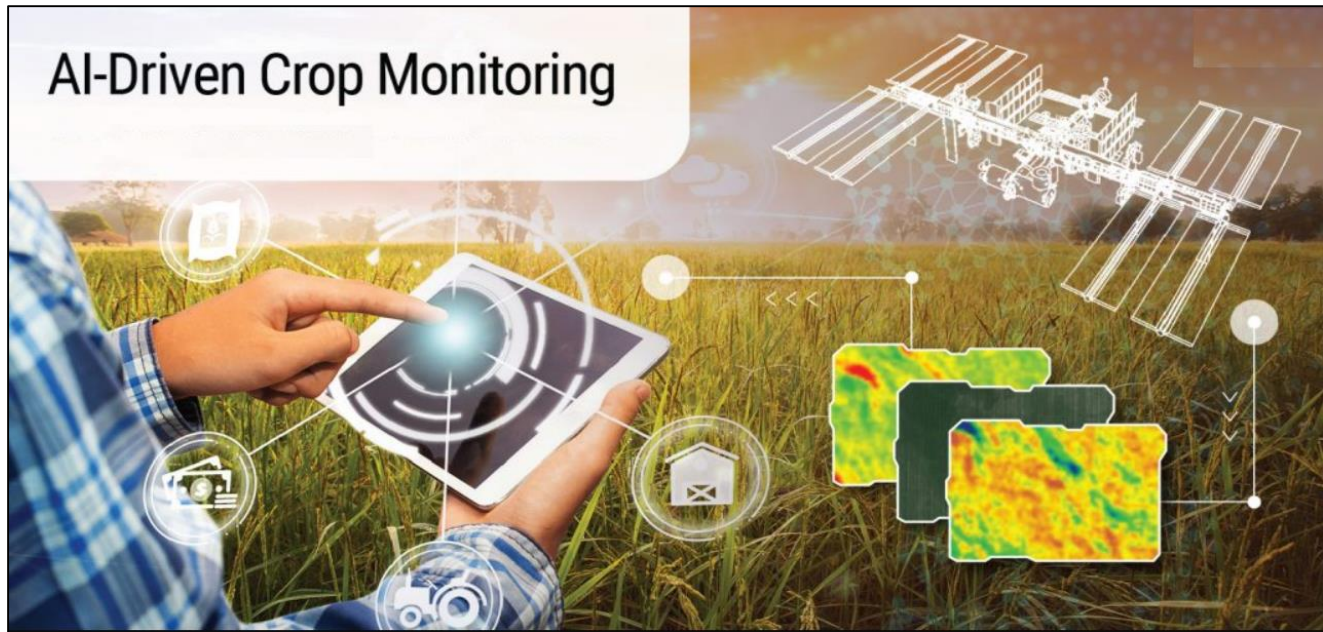
DISCOVER THE ESRI USER CONFERENCE

Find innovation, inspiration, and motivation as you explore all things GIS with technical experts, peers, and exhibitors. Browse the beautiful Map Gallery entries. Check out products and solutions in the Expo and Esri Showcase, and shop at the Esri Merch Store.

In Person	Digital Access
Standard—\$2,075	\$99/No Cost
Register to attend in person	Available May 19
Additional registration rates are available. See rates table below	This is complimentary if you are current on your maintenance plan or subscription.

Building an Agricultural Statistics Database

(Applying Remote Sensing and Machine Learning algorithms)



Land use and land cover mapping are essential to agriculture and other industries as it provides information about land area. By leveraging the power of AI-driven crop monitoring, farmers can now access up-to-date data on their land, improving the accuracy of their decisions and allowing them to maximize yields.

Data processing and Technology

Remote sensing classification is an important technique used to analyze and classify large agricultural areas. This technique can be used to identify different types of crops, land use/cover, soil type and vegetation health in a given area.

GeoAI/ Python AI is an emerging scientific discipline that combines innovations in spatial science, artificial intelligence methods in machine learning (e.g., deep learning), data mining, and high-performance computing to extract knowledge from spatial big data.

Big-data using Random forest machine learning algorithms can be used to help with the classification and assessment of land cover mapping.

Remote sensing and ML tools can be used to build an agricultural statistics database and gain insight into land use/cover. This technology can provide farmers with an efficient way to monitor the health of their crops, while also enabling the government to track agricultural trends across the country. Also, this data can provide valuable information to farmers in terms of crop optimization, pest management and other decision making processes.

By using Random forest machine learning algorithms, organizations can gain understanding of their data sets and assess land cover mapping projects. It is a supervised learning algorithm that uses decision trees in order to create an ensemble of models that can be used for prediction.

(PlanetScope 30-m) satellite 30-m time-series imageries data can provide information to detect changes in the environment over geographical regions.

Normalized Difference Vegetation Index (NDVI) or Enhanced Vegetation Index (EVI) are two popular methods used by remote sensing experts to identify the types and condition of vegetation in an area. They help map out different types of vegetation, such as grasslands, shrubs and trees. This data can then be used to assess crop health and performance, identify areas prone to drought or pests and determine optimal planting times. With the help of these indices, farmers can reduce cost and ensure that their crops reap maximum yields.

Enhanced Vegetation Index is similar to Normalized Difference Vegetation Index and can be used to quantify vegetation greenness. However, EVI corrects for some atmospheric conditions and canopy background noise and is more sensitive in areas with dense vegetation.

Applications of Artificial Intelligence and Machine Learning

- Land Use and Land Cover Classification Using Deep Learning
- Oil & Gas - Offshore Oil exploration, Oil Spills
- Sea Port and Fisheries
- Airports
- Transportation- Road Condition, Traffic Prediction
- Urbanization Change Analysis & Planning
- National Mapping and Statistical Organizations
- Retail & Marketing
- Medical & Health
- Stock Markets Trading
- Social Media Personalization

Announcing the 2023 Esri Community Contest



Based on the success of the previous two years' contests, we've decided to keep the same format for 2023. The contest format accounts for new community members to our most elite MVP members. The 2023 contest will run from Jan 1, 2023 through December 31, 2023 and is open to community members excluding Esri staff and distributors.

Contest Levels

Elite Level (top three)

Winners at this level will be assessed on most solutions authored for the year – designed for advanced members who are answering questions and recognized with accepted solutions

Rising Star (top three)

Winners for this level will be selected based on the following criteria:

- Any member of the community that is part of the Regular rank ladder (excludes MVPs)
- Most contributions (minimum 100 value add posts: can be either new posts and/or replies)
- Most solutions authored (minimum 10)

Newcomer of the Year level (top three)

Winners will be selected based on the following criteria:

- New member as of Jan. 1, 2023
- Most contributions (minimum 25 value add posts: can be either new posts and/or replies)
- Combination of return visits and time spent online

Contest Rewards

Prizes will be awarded to the top three candidates at each of the above levels

Elite Prize Package (top three)

- Winner's choice of either Esri UC Conference Registration or Dev Summit Conference Registration**
- ArcGIS for Personal Use License, or Developer Subscription
- Choice of Esri Press Publication
- Esri Community contest winner badge
- Esri swag box

Rising Star Prize Package (top three)

- Winner's choice of either Esri UC Conference Registration or Dev Summit Conference Registration**
- Choice of Esri Press Publication
- Esri Community contest winner badge
- Esri swag box
- Considered for MVP Rank

Newcomer Prize Package (top three)

- Choice of Esri Press Publication
- Esri Community contest winner badge
- Esri swag box

[Esri Community Contest 2023 Official Rules](#)

ArcGIS GeoBIM for Infrastructure development

Client: Bahrain Airport Company (BAC), Kingdom of Bahrain

MicroCenter had an opportunity to deliver the power of BIM, ArcGIS GeoBIM technology in a Proof- of -concept project for the Bahrain Airport Company (BAC).

We were able to demonstrate how this technology could be used in various use cases for the real-time IoT-BIM-based digital transformation, Building Permits, Construction, Infrastructure Management objectives. With these new solutions, we have the ability to implement innovative solutions that can help our clients to save the time, money and increase efficiency for their projects.

It is expected that the use of GeoBIM will continue to increase in the future, and MicroCenter objective is to reach our clients very close to understand their specific business requirements and deliver the best solutions.

ArcGIS GeoBIM helps in enabling capabilities to link Survey Cad drawings, As- built drawings like i.e. Engineering drawings, Topographic Survey documents, Building footprints, Property information documents, Legal documents, Land Administration and Land Records (documents, records). within GeoBIM projects, you can link georeferenced ArcGIS features with Autodesk records.

Also link Statistical & graphics reports to keep track of AEC workflows. This makes it to access, visualize, and query project documentation from the ArcGIS GeoBIM environment, then configure web-based applications with these links that enable easier communication and collaboration for all stakeholders within a secure environment.



Picture: Infrastructure Survey Team at BAC

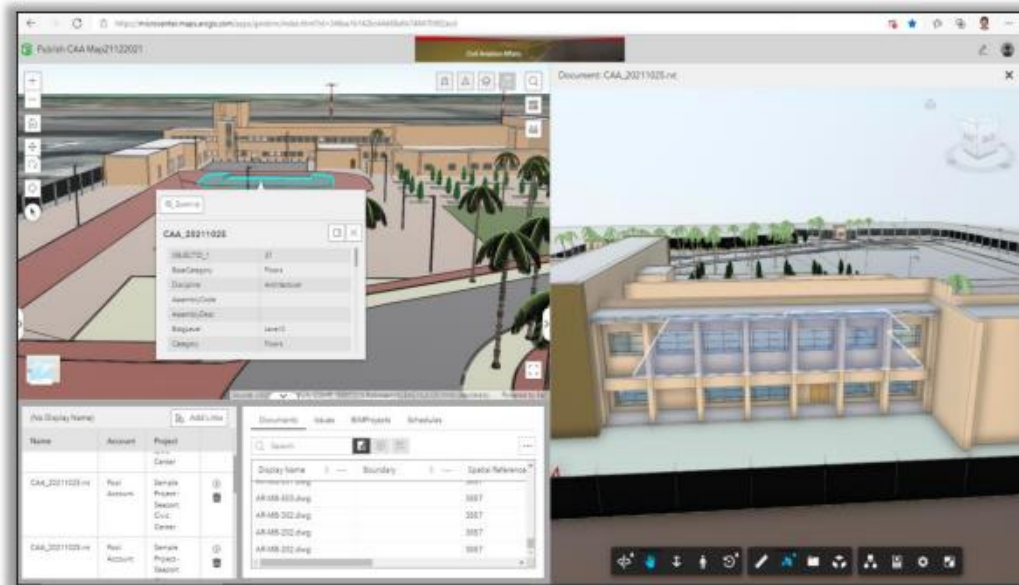


Figure: GeoBIM data (.rvt) integration with ArcGIS GeoBIM

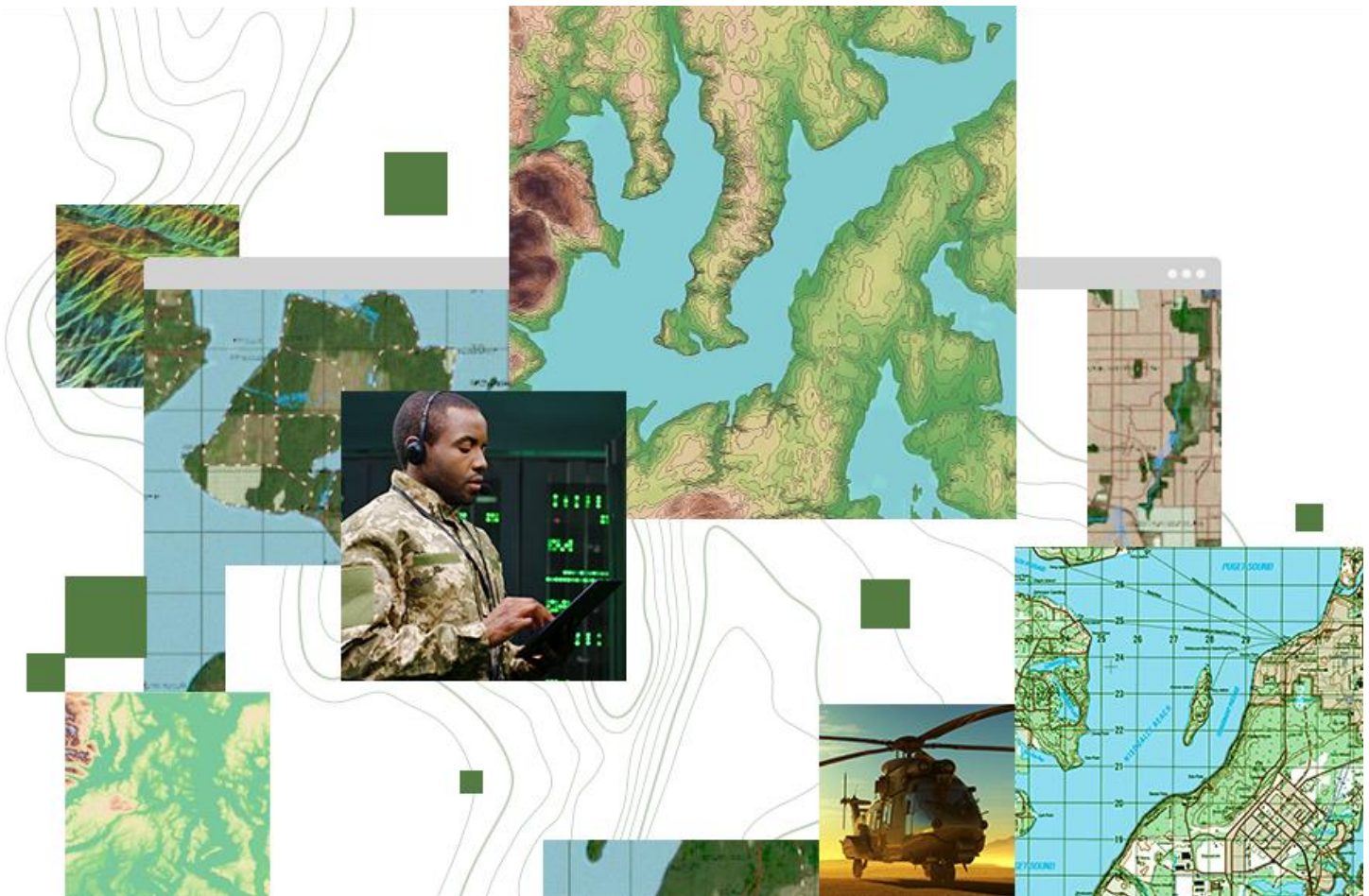


Figure: Autodesk Revit Model (.rvt)

Technology:

FARO 3D Survey, Autodesk BIM 360 Collaborate Pro, Autodesk Revit2023, Esri ArcGIS Pro 3.0, ArcGIS Online, ArcGIS GeoBIM.

What's new in ArcGIS Defense Mapping



Welcome to another release of ArcGIS Pro! We're excited to share details about the newest functionality available with the topographic production extensions for ArcGIS Pro 3.1. Highlights include:

- New topographic elements that can be added to your layouts included with the Defense Mapping extension
- A new geoprocessing tool to help ensure spot height accuracy
- Two geoprocessing tools in the Topographic Production toolbox used to export and import Multinational Geospatial Co-production Program (MGCP) metadata now support MGCP Urban Vector Data (MUVD) metadata
- The Defense Mapping extension product files for ArcGIS Pro include an add-in that can be used to review the metadata XML not as a machine, but in a format for humans

New surround elements

An Image City Map (ICM) is a National Geospatial-Intelligence Agency (NGA) map product. In the previous release of ArcGIS Pro, the Calculate Metrics geoprocessing tool was enhanced to support the precision of the ICM product. This tool populates metrics for features in a geodatabase, including Military Grid Reference System (MGRS) values. With the ArcGIS Pro 3.1 release, those values are used to create the two new elements.

Topographic Production toolbox

The Topographic Production toolbox has a new geoprocessing tool to help ensure the height values for spot heights are accurate. Typically, spot heights derive their height value from an elevation attribute of the contour line next to them. The [Validate Spot Heights geoprocessing tool](#) checks that the spot height values are higher than or equal to the corresponding contour line's height. Using the configured contour interval value, the tool also checks for missing contour lines between a spot height and a contour's highest point.

Other enhancements

There is a new enhancement to workflows that involve data maintenance. The step in a workflow that opens a map can be configured to [clip the map and its data to the job AOI](#). This means less data to handle, which requires less processing power. Jobs run in the background are also now prioritized.

When it comes to generalization, the following is a list of enhancements included with the Defense Mapping and Production Mapping product data files:

- There is a new tool to [increase a polygon's area](#).
- There is a new tool to [extend a polygon's sides](#).
- There is a new [Thin Features tool](#) that enhances the way points are clustered.
- Different thin tolerances can be specified for the General Point model.
- When converting polygons to points, you can specify the building angle on the point.
- When thinning buildings, you can thin different tolerances based on the distance from a built-up area.
- How the built-up areas are aggregated has been improved.

For more details: [Click Here](#)

ESRI Publications



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ArcUser Fall 2022
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MicroCenter Group

Founded in 1983, MicroCenter Group is a pioneer in providing information technology solutions in Bahrain. Initially it was started with the aim of providing customized IT solutions to small and medium organizations but today with over 100 customers, both in the Government and private sector it has attained a leadership position in the industry within the country. With four group companies and an office in Saudi Arabia, today it has diversified into various other businesses that include IT Business Solutions, Geographical Information Systems (GIS), Utility network GIS surveys, LiDar Technology / BIM modeling, and Digital media solutions & Specialized training.

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