ArcGIS Enterprise
Building Raster Analytics Workflows
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What is Raster Analytics?

- The ArcGIS way to create and execute spatial analysis models and image processing chains which leverage distributed storage and analytics

- ArcGIS Enterprise + ArcGIS Image Server
Raster Analytics User Experiences

ArcGIS Pro

ArcGIS Pro provides a variety of tools for raster analysis, including:
- Geoprocessing tools
- Raster functions
- Analyze patterns
- Analyze terrain
- Create workflows

Web

The ArcGIS API for Python allows for the creation of custom web applications, including:
- Generate analysis output
- Display results on a map

ArcGIS API for Python

The ArcGIS API for Python enables developers to integrate ArcGIS functionality into custom applications, offering tools like:
- Calculating the final analysis output
- Displaying the results on a map
Raster Analytics Workflows

- ArcGIS Pro "Out of the Box" Analysis
- ArcGIS Pro Custom Analysis
- ArcGIS Enterprise "Out of the Box" Analysis
- ArcGIS Enterprise Custom Analysis
- Python for Developers and Systems Integrators
- ArcGIS API for Python and Jupyter Notebooks for Developers and Researchers
- ArcGIS REST API for Web Developers
ArcGIS Pro "Out of the Box" Analysis

- **Local Processing**
  - "on the desktop"
  - Image Analyst Tools
  - enhanced parallel processing tools
  - geoprocessing Model Builder
  - leverage all geoprocessing tools
  - single raster functions

- **Distributed Processing**
  - "on the server"
  - run individually
  - best practice for modeling is writing a script tool
ArcGIS Pro Custom Analysis

- **Local Processing**
  - "on the desktop"
  - "on-the-fly" results
  - Raster Function Editor
  - Output Layer Type = Raster Layer

- **Distributed Processing**
  - "on the server"
  - full resolution persistent results
  - Raster Function Editor
  - Output Layer Type = Web Image Layer

**Visual Modeling**

- Raster Layer
  - Creates a new raster layer that does processing at the display resolution and extent. Data is processed on-the-fly each time it is rendered to the display.

- Web Image Layer
  - Creates a new web image layer hosted in your ArcGIS organization. By default, data is processed at source resolution and extent. The processing is distributed across ArcGIS servers.
ArcGIS Pro Demo

Jie Zhang
ArcGIS Enterprise "Out of the Box" Analysis

- **Distributed Processing**
  - "on the server"
  - full resolution persistent results
  - via Map Viewer
ArcGIS Enterprise Custom Analysis

develop custom processing models and share to Portal from Pro

Raster Function Template item

browse and search for Raster Function Template items

form generated, user supplies parameters and runs the custom analysis
complete web user experience for visual modeling - "raster function editor for Map Viewer"
ArcGIS Enterprise Demo
Jie Zhang
Python for Developers and Systems Integrators

ArcGIS API for Python

```python
import numpy as np

class HelloWorld():
    def __init__(self):
        self.name = "Hello World Function"

    def getParameterInfo(self):
        return [(
            'name': 'r',
            'dataType': 'raster'
        )]

    def updatePixels(self, src, tlc, shape, props, **pixelBlocks):
        r = pixelBlocks['r_pixels'] + 10
        pixelBlocks['output_pixels'] = r.astype(props['pixelType'])
        return pixelBlocks
```

distributed as part of the arcgis conda package

custom algorithms
leverage Python package ecosystem
use in ArcGIS Pro and ArcGIS Enterprise

enterprise automation
enterprise integration
models built from existing functions

Python Raster Function API

https://github.com/Esri/raster-functions
ArcGIS API for Python and Jupyter Notebooks for Developers and Researchers

- display Image Layers
- apply dynamic on-the-fly processing
- construct raster function chain (i.e. models in code)
- run models using distributed processing
- design, develop, prototype
ArcGIS REST API for Web Developers

- run out of the box analytics
  - [http://esriurl.com/rarestapi](http://esriurl.com/rarestapi)

- model analysis in JSON and run using distributed processing
  - [http://esriurl.com/rasterfunc](http://esriurl.com/rasterfunc)
Developer Demo

Jie Zhang
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Select the Feedback tab

Complete answers and select “Submit”