

# EXO-BASE

ON-ORBIT SATELLITE INSIGHT



## >> EXO-BASE

Exo-Base is a geospatial analytics service powered by Sidus Space's proprietary FeatherEdge system. The platform provides customers near real-time intelligent insight on earth observation images.

The FeatherEdge system will be integrated into all of Sidus Space's upcoming satellite missions. The system works by receiving images in real time directly from the onboard camera and running them through an advanced processor hosting trained AI/ML models. Applications that are hosted on board can be uploaded to the platform at any time through an easy-to-use API, enabling customers flexibility on orbit.

### » GET NEAR REAL-TIME INSIGHT ON SATELLITE IMAGERY

The Sidus Space Analytics Platform runs artificial intelligence and machine learning (AI/ML) models on satellite imagery as it collected, all on-orbit

### » ONLY PAY FOR THE RELEVANT INFORMATION

No need to go through hundreds of images to find the information you're looking for. Tell us the areas you want imaged and the insight you need from those images and we'll simply send the relevant information.

### » MISSION FLEXIBILITY

Users can choose what they want detected from satellite imagery using our proprietary algorithms. Algorithms are capable of being configured and updated in orbit to meet the changing mission needs of any user.

1

### PLAN MISSION

- » Pick areas to be imaged
- » Specify desired revisit rate
- » Determine desired insight from image

2

### RECEIVE DATA

- » Satellite imagery taken
- » Satellite imagery processed on-orbit
- » Data downlinked to ground and sent to end user

3

### MISSION TEST

- » Mission parameters uploaded to satellites
- » Algorithm tested on-orbit
- » Mission parameters validated

## >> FEATHERWARE

FeatherWare is an ultra light-weight, hardware agnostic, intelligent middleware for hosting machine learning applications and analytics on-orbit. FeatherWare's intelligent message passing interface specification allows for a unified control flow for host applications to run across all programs, integrating multiple data sources for more consistent, accurate, and relevant customer data.

Mission operators can release software application updates in a modular manner ensuring more flexibility during mission operations and also eliminating the need for complete application updates from scratch.

FeatherWare is hardware agnostic, enabling mission operators to use virtually any hardware platform edge device in heterogeneous environments for delivering insights from disparate sensor types. Combined with FeatherBox, it provides a complete AI payload for on-orbit edge computing.

## >> SOFTWARE HOSTING

Sidus Space offers the ability to run a customer's artificial intelligence/machine learning (AI/ML) software models on Earth Observation satellites without the customer having to launch their own. Software models are hosted on Sidus Space's FeatherEdge payload, comprising of its own dedicated CPU, GPU and AI accelerator, capable of performing 4 trillion operations per second. The FeatherEdge payload receives images in real time, directly from the satellites onboard camera and runs the raw images through the customer's AI/ML models. Processed data is sent directly to the customer after downlink through an easy to use API. Customers have the flexibility to specify desired areas of interest for imaging, upload and update the models at any time, and receive the processed data according to their schedule.

## >> FEATHERAPPS

FeatherApps are custom trained machine learning algorithms for space-based applications made by 3rd party developers and deployed on-orbit. The algorithms can be trained to support a range of applications, including: tracking a satellite docking feature using machine vision; detect and locate nearby space objects; perform object detection on Earth observation images in real-time; etc.

FeatherApps are built based on the customer's requirements and the algorithms are trained using customer defined datasets created from real-data, synthetic data, or a combination of both. To ensure flexibility during mission operations, FeatherApps are capable of being configured and updated on-orbit to meet the changing mission needs of any customer.

### FUNCTIONALITY

- » Host Machine Learning Applications
- » Task Scheduling/Timekeeping
- » Packetizing/Storing/Forwarding messages to and from satellite bus
- » System Health Checks
- » Non-volatile memory read and write
- » Fault detection and handling
- » Ingest and verify updated software packets

### FUNCTIONALITY

- » COMPUTING HARDWARE
  - » Powerful machine vision processor and AI accelerator
- » FLEXIBILITY
  - » Ability to upload multiple models at once and change mission needs at any time.
- » REDUCED COST
  - » Simple monthly fee structure for hosting software models.

### USE CASES

- » METHANE EMISSION MONITORING
  - » Identify sources of GHG release to support enforcement and remediation
- » WILDFIRE WARNING AND TRACKING
  - » Identify high fire risk areas, as well as mapping and characterization of active fires for to support efficient prevention and suppression activities
- » SITUATIONAL AWARENESS
  - » Map, locate, detect, and characterize nearby objects to support autonomous maneuvering of satellite systems and improve safety of flight.