



Satellites as Virtual Data Centers

The Case for Edge AI in Orbit

Exploring secure, AI-powered compute networks in space

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Space Tech Expo USA 2025

SATLYT



Current Infrastructure Bottlenecks



Data Volume

50TB+ daily from Earth observation satellites alone, overwhelming ground infrastructure



Latency

Minutes to hours delay in data processing, limiting real-time applications



Ground Access

Limited ground station availability creates data transmission bottlenecks

As satellites become more autonomous, the need for onboard processing becomes critical

Edge Computing in Space

Edge computing brings processing power closer to data sources, enabling real-time analysis and decision-making without relying on distant cloud infrastructure. In space, this means processing data directly onboard satellites.



Smart Data Collection

Satellites autonomously prioritize data collection based on mission objectives and detected events



Real-time Analysis

Onboard AI models detect anomalies and patterns, enabling immediate response to critical events



Autonomous Coordination

Satellites work together to optimize coverage and share processing resources

Virtual Data Centers in Space



Onboard Compute

- Dedicated processing units
- AI acceleration
- Task scheduling



Storage Systems

- Distributed caching
- Data buffering
- Relay optimization



Network Fabric

- Inter-satellite links
- Ground coordination
- Mesh networking

Software-defined systems enable real-time, scalable, and resilient space operations

AI Models in Space



Onboard AI reduces dependency on Earth-based compute, enabling autonomous operations and real-time decision making in space.



Anomaly Detection

Real-time monitoring of satellite health and performance metrics



Smart Prioritization

Intelligent selection of data capture and transmission priorities



Dynamic Allocation

Automated workload distribution across satellite networks

AI-powered satellites form the foundation of autonomous space infrastructure

Intersatellite Links (ISLs)



Direct satellite-to-satellite communication enables autonomous coordination and data sharing without ground station reliance.



Autonomous Coordination

Satellites self-organize for optimal data processing and relay operations



Load Balancing

Dynamic distribution of compute tasks across available satellites



Reduced Dependency

Minimized reliance on ground infrastructure for routine operations

ISLs enable the creation of resilient, software-defined mesh networks in orbit

Environmental & Economic Benefits



Reduced Emissions

Minimized data transfer and cloud storage needs decrease ground infrastructure energy consumption



Cost Efficiency

Reduced reliance on expensive ground station networks and commercial cloud services



Resource Optimization

Monetization of otherwise idle satellite compute capacity

Building a more sustainable and efficient space economy

Satlyt: Enabling the Orbital Cloud

We network disconnected satellites into a virtual cloud for edge computing, enabling AI inference, task routing, and data filtering in orbit.

<> Software-First Approach

- Built to run on any satellite
- Hardware-agnostic platform
- Open, modular architecture



Mission Impact

- Reduces downlink waste
- Enhances mission autonomy
- Enables data sovereignty



Team & Traction

Team background:

- SpaceX (Starlink)
- Google (AI/Cloud)
- Cornell (PhD Research)
- Anduril & Northrop

Current status:

- AgriSat MVP live with customers
- Multiple industry partnerships
- Deploying pilot in 2025



Rama
Afullo



Gloire
Rubambiza



Meyonka
Gray

Building the operating layer for the orbital edge... One node at a time

Thank You

Let's build the future of space infrastructure together

📄 Submit questions via Slido: #Space25

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