

By  
Oquirrh Labs

LabLab SpaceExploration AI Hackathon

# TriRed LM



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# Bringing Reliable AI Decision Support to Space Missions



# The Challenge

*Every space mission faces a **critical** constraint:*  
when something goes wrong, Earth is minutes or hours away.

- Memory corruption from cosmic radiation can lead to hallucinations
- Traditional LLMs provide no warning before degradation
- No mechanism exists to verify response accuracy

## **The Cost of Failure:**

- Incorrect AI guidance could cost billions in equipment
- Human lives depend on reliable AI assistance
- No room for error in deep space operations

Consider the Mars Rover: A single cosmic ray could corrupt an LLM's memory, causing it to provide dangerous guidance during a critical maneuver. With a 40+ minute roundtrip to Earth for instructions, the damage would already be done.

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# Market Size

Total Addressable Market

**\$600B** *by 2030*

Space AI/ML market\ to grow at 22.5% CAGR

Serviceable Addressable Market:

**\$150B**

Spacecraft autonomy systems and satellite

Operations

Initial Target Market:

**\$20B**

Earth orbit missions

# Core Technology

Distributed Resilient Intelligence

## Triple Redundancy approach

- Three independent AI agents cross-validate decisions
- Consensus-based response generation
- No single point of failure

## Space-Optimized Design

- Lightweight models optimized for space hardware
- Operates within strict resource constraints
- Designed for radiation-hardened systems

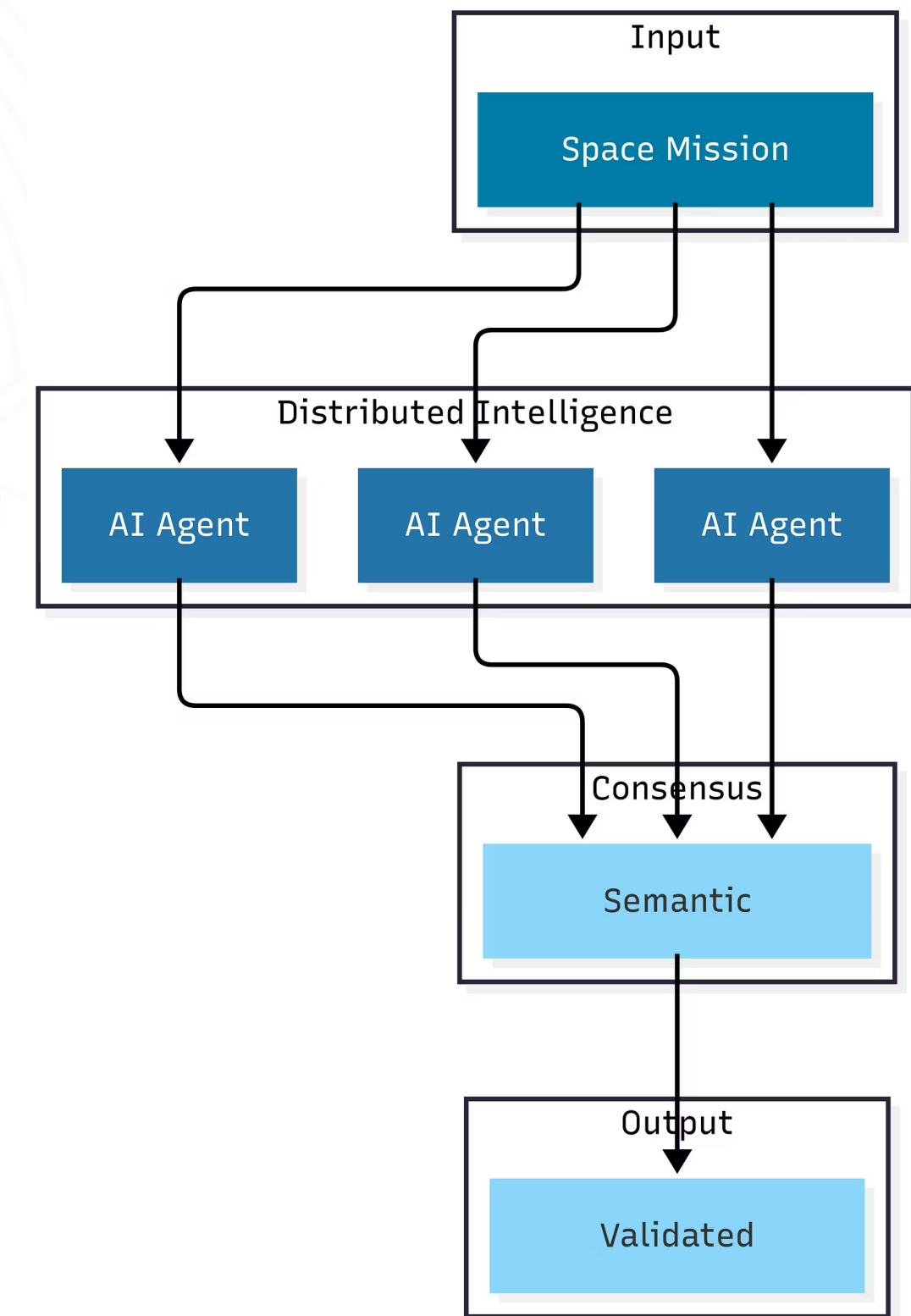
## Knowledge Integration

- Real-time integration with spacecraft
- Comprehensive space operations knowledge base
- Continuous learning from mission data

# Technical Deep Dive

TriRed LM agentic framework guarantees that the system always has a set of nodes online, which leads to consistent progress and trustworthy responses.

Uses Lightweight consensus algorithm and high accuracy similarity search Algorithm



# Competitive Advantage



Triple redundant  
architecture

VS

Single Point of Failure



Lightweight deployment

VS

High resource requirement



Fully autonomous space  
optimized agent

VS

Requires constant Earth connection



Graceful  
degradation

VS

Binary (working/failed) states





# Milestones



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# Meet the Team At Oquirrh Labs

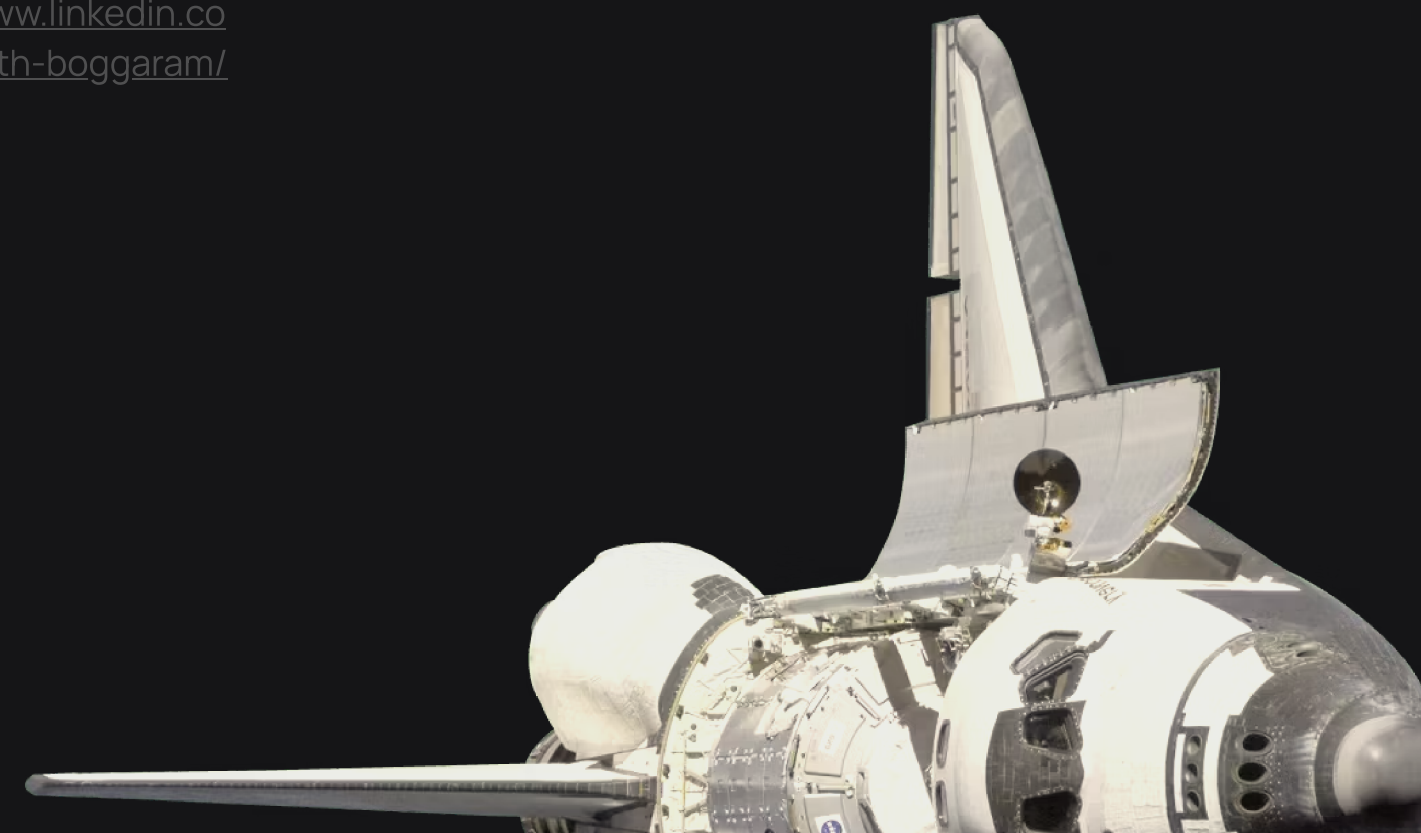
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