

NASA Space Mission AI Planner

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Project Overview

- This project outlines a conceptual AI system designed to assist NASA with daily planning for Mars rover missions.
- The AI would help generate safe, efficient schedules and travel routes based on terrain, weather, and power constraints.
- It addresses the challenges of unpredictable environments and slow communication with Earth.
- Inspired by real NASA mission planning tools, rover operations, and testing simulations.
- Goal: Improve mission success by enhancing decision-making and reducing manual workload for engineers.

Problem Statement

- Mars planning is complex due to rough terrain, weather, and limited resources.
- Engineers need support tools that are fast, smart, and reliable.
- This AI tool aims to ease the load by offering mission plans that reduce risk and save time.

AI Concept and Features

- AI analyzes terrain, energy, and tasks to suggest routes and schedules.
- Learns from previous mission data and adjusts to new conditions.
- Provides explanations for its decisions to build user trust.

Simulated Testing Plan

- Built a digital Mars simulation using real conditions.
- Inspired by Space Center Houston's interactive exhibits and Medium case studies.
- Phases include: unit testing, integration, human feedback, and stress testing.

Success Criteria

- Accurate, risk-aware plans.
- Faster than manual planning.
- Positive engineer feedback.
- Reliable under unusual Mars conditions.

Post-Test Improvements

- Add more training data to help the AI learn from edge cases.
- Make explanations easier to understand.
- Improve power usage predictions.
- Simplify controls for users.

Project Outcome and Reflection

- This AI tool has strong potential to support Mars planners.
- Realistic testing shows where it works well and where to improve.
- Next steps: expand test data, improve interface, and explore real-world use.

References