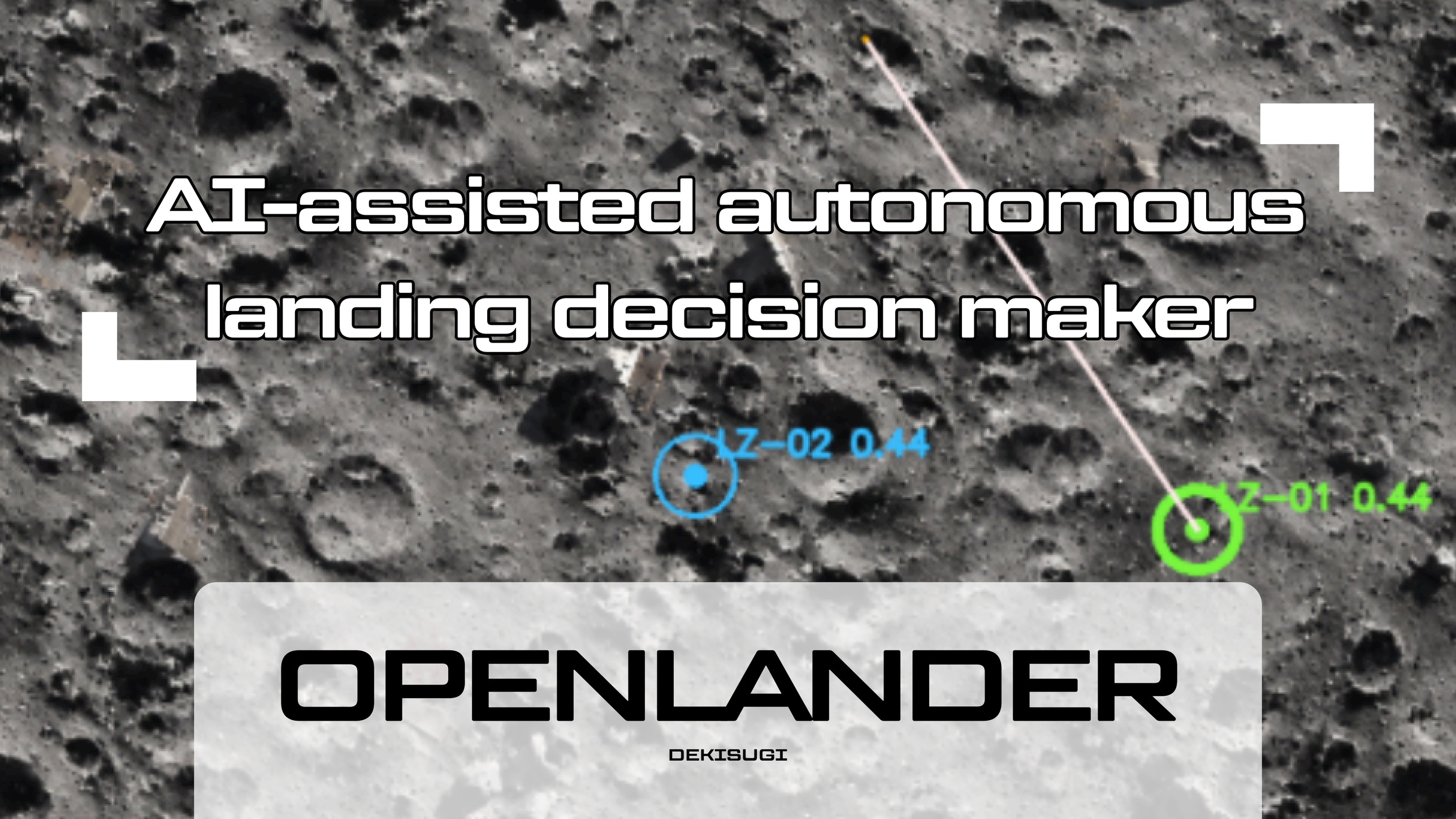
AI-assisted autonomous landing decision maker



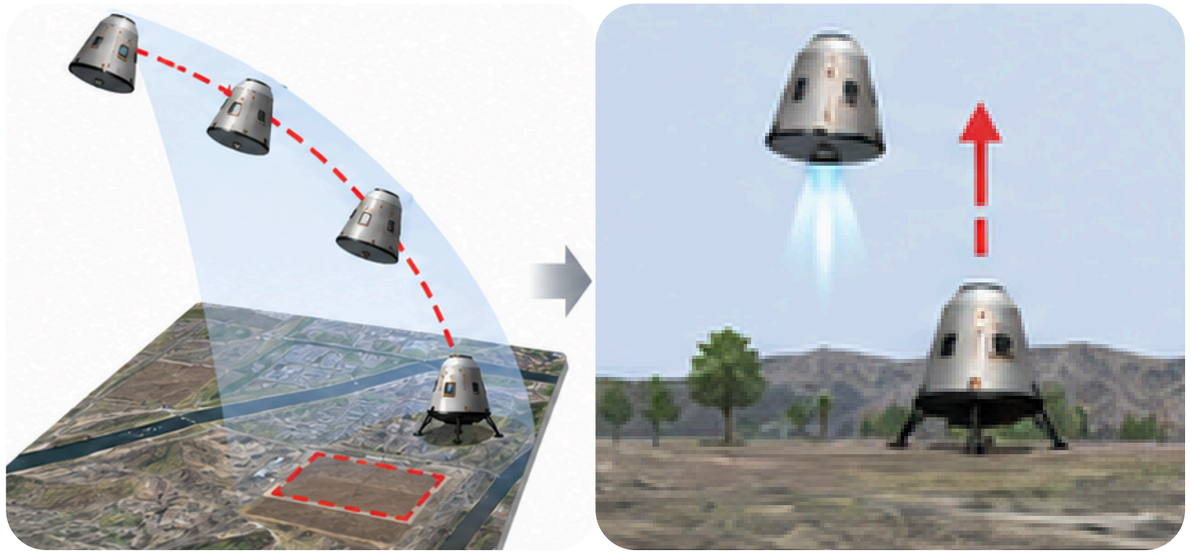
OPENLANDER

DEKISUGI



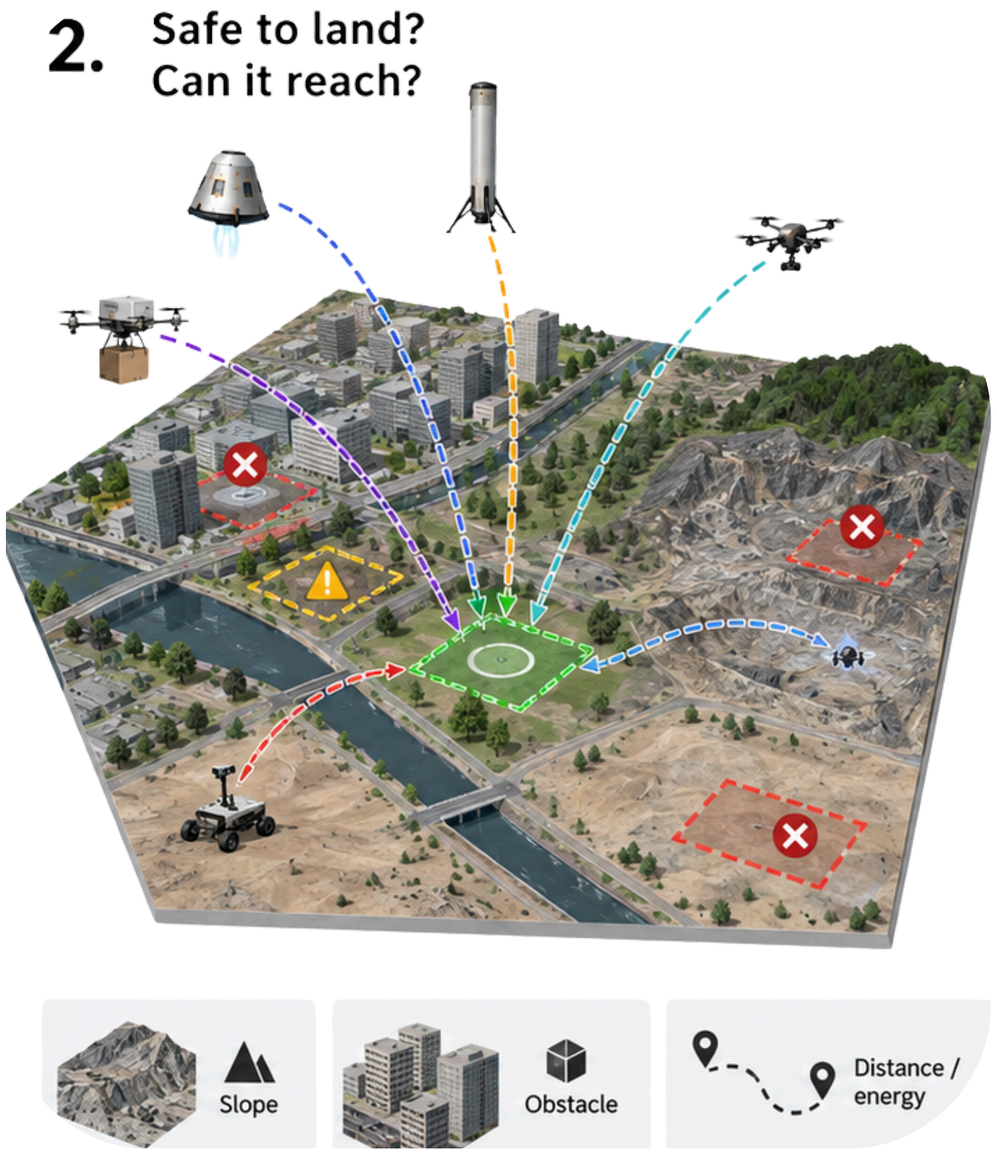
BACKGROUND

Today's spacecraft landings need its own careful plan with a limited set of known situation. This approach becomes costly and inefficient as autonomous missions increase.



This is rare, expensive and individually designed.

However...
In the future, many more vehicles will need to land autonomously.



SOLUTION

We need a landing system that is...

FLEXIBLE

Understand unfamilliar terrains immediately.

AUTOMATIC

Find safe zone automatically.

ADAPTABLE

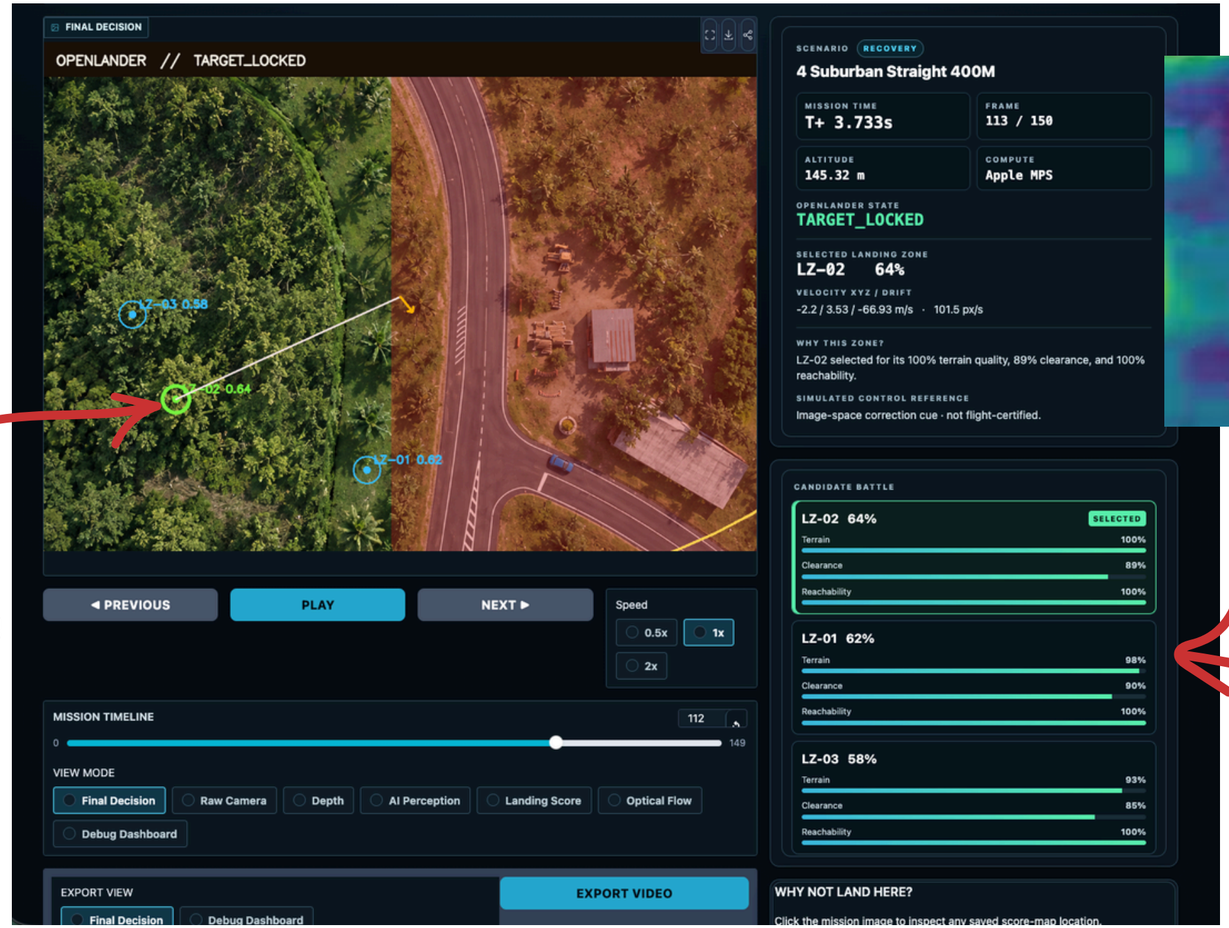
When conditions change due to descent & weather.

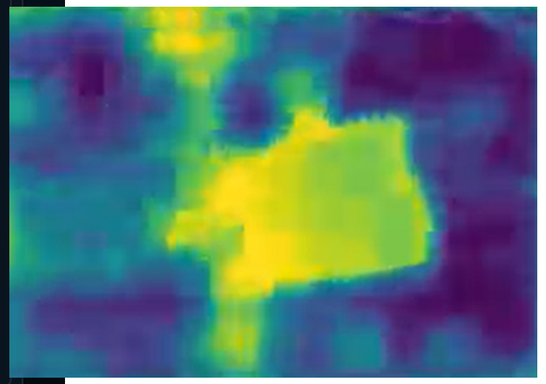
EXPLAINABLE

Explain why a landing site was selected.

OPENLANDER

An adaptive, AI-powered landing assistant system





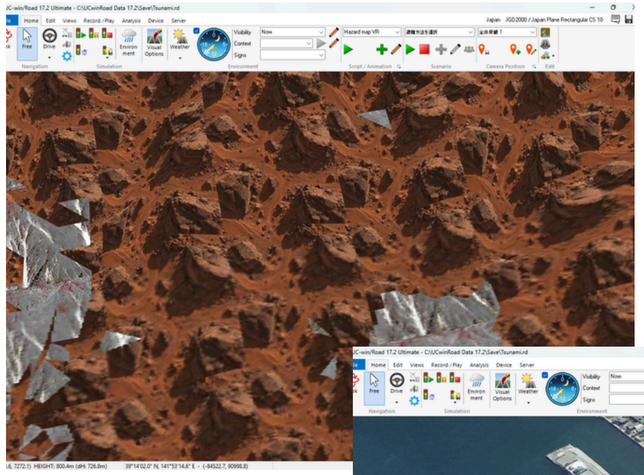
AI perrception

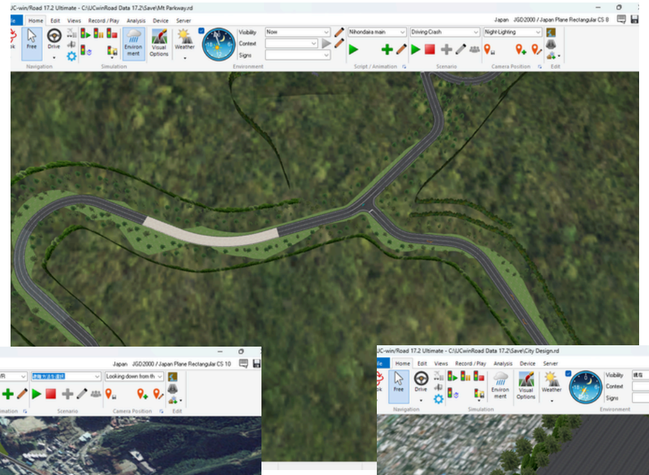
Candidate tracking

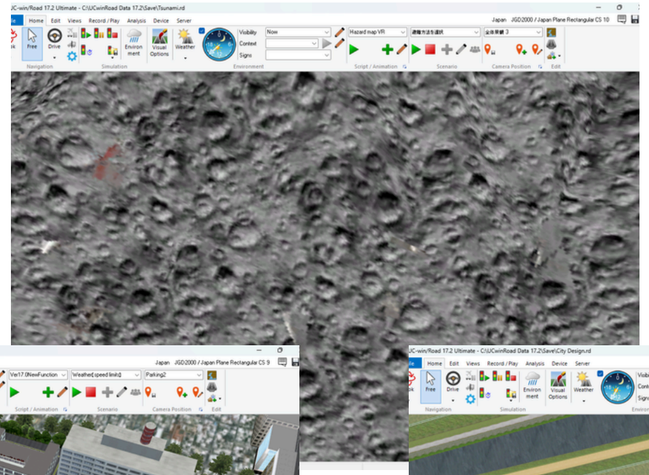
Landing score

TRAIN & TEST DATA

Using scenarios built with UC-win/Road **+ AI enhancements**

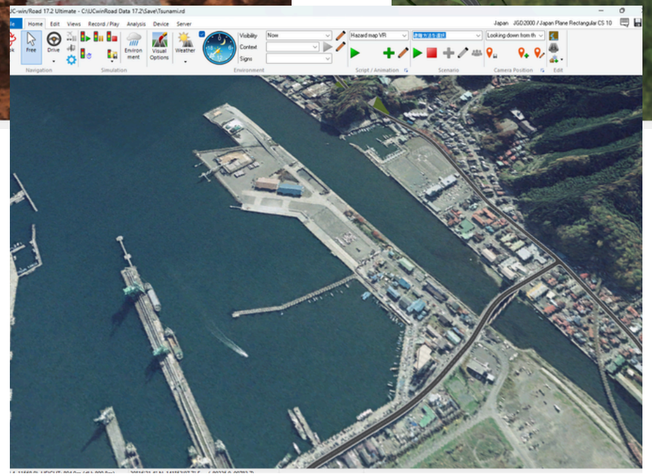


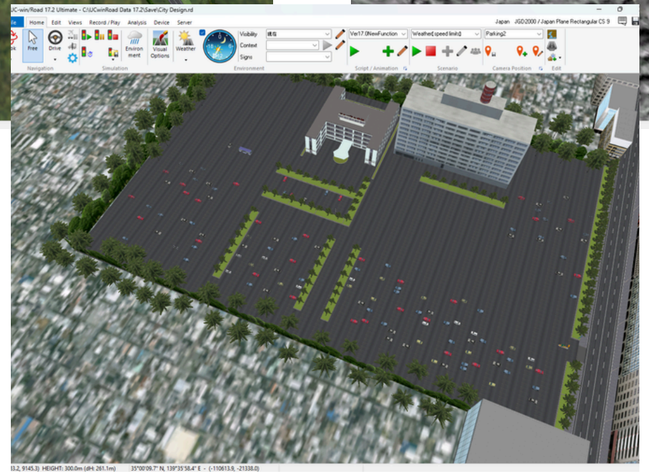


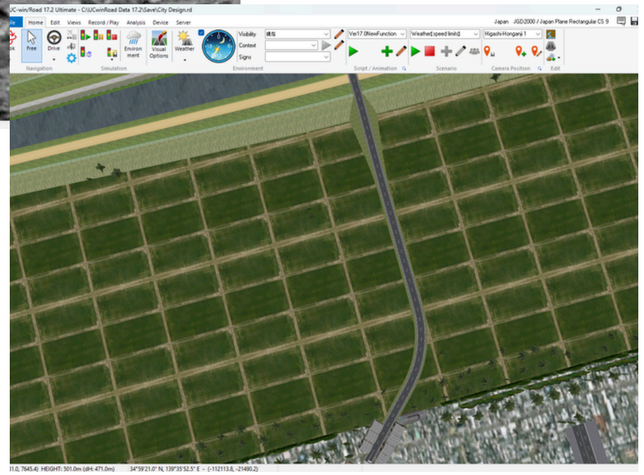


landing
on Moon

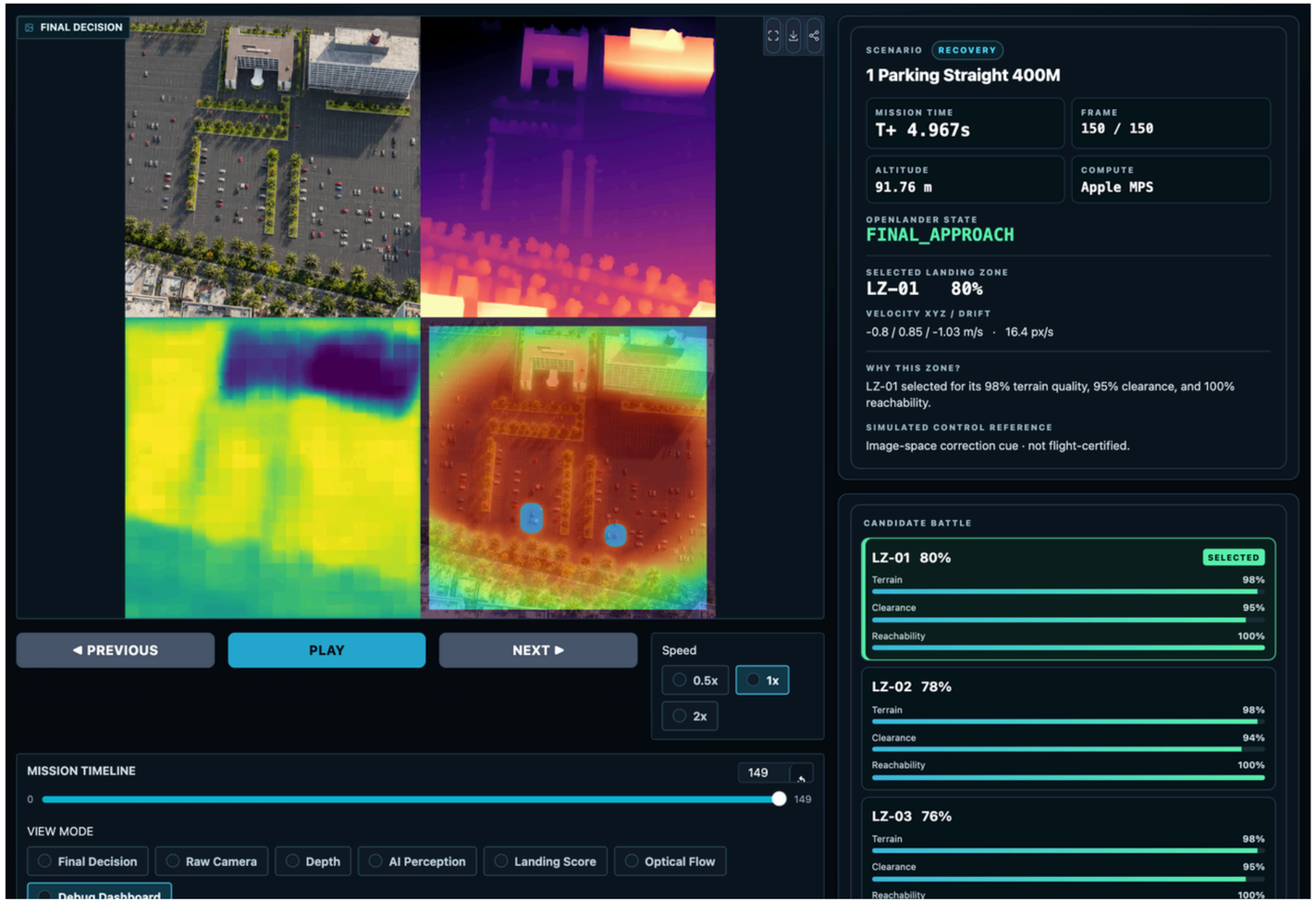
landing
on Mars







RESULT



- 40+ scenarios / 8 environment types tested
- 100% scenarios reached TARGET_LOCKED
- 100% final targets remained inside the reachable envelope
- 50 ms average processing time per frame
- 88% agreement between visual-drift direction and known simulated drift
- 93% of selected landing footprints free from detected hazards
- 90% temporal target stability after target lock

ADVANTAGES

SAFETY & REACHABILITY AWARE	Priority not only safety but also practical to reach human facilities.
ADAPTIVE IN REAL TIME	Continuously updates its understanding and can change targets during descent.
EXPLAINABLE	Shows how each candidate is scored, why the final site is selected.
SCALABLE	Can be use in many terrains, weathers and for various vehicles.

FUTURE DEVELOPMENT

- Hardware integration with spacecraft and autonomous vehicles.
  - Add sensors
  - Add PID controller
  - ...

- Validate the system on drones and experimental landing platforms.
- Develop a plugin to simulate detailed landings scenarios in UC-win/Road



THANK YOU!



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