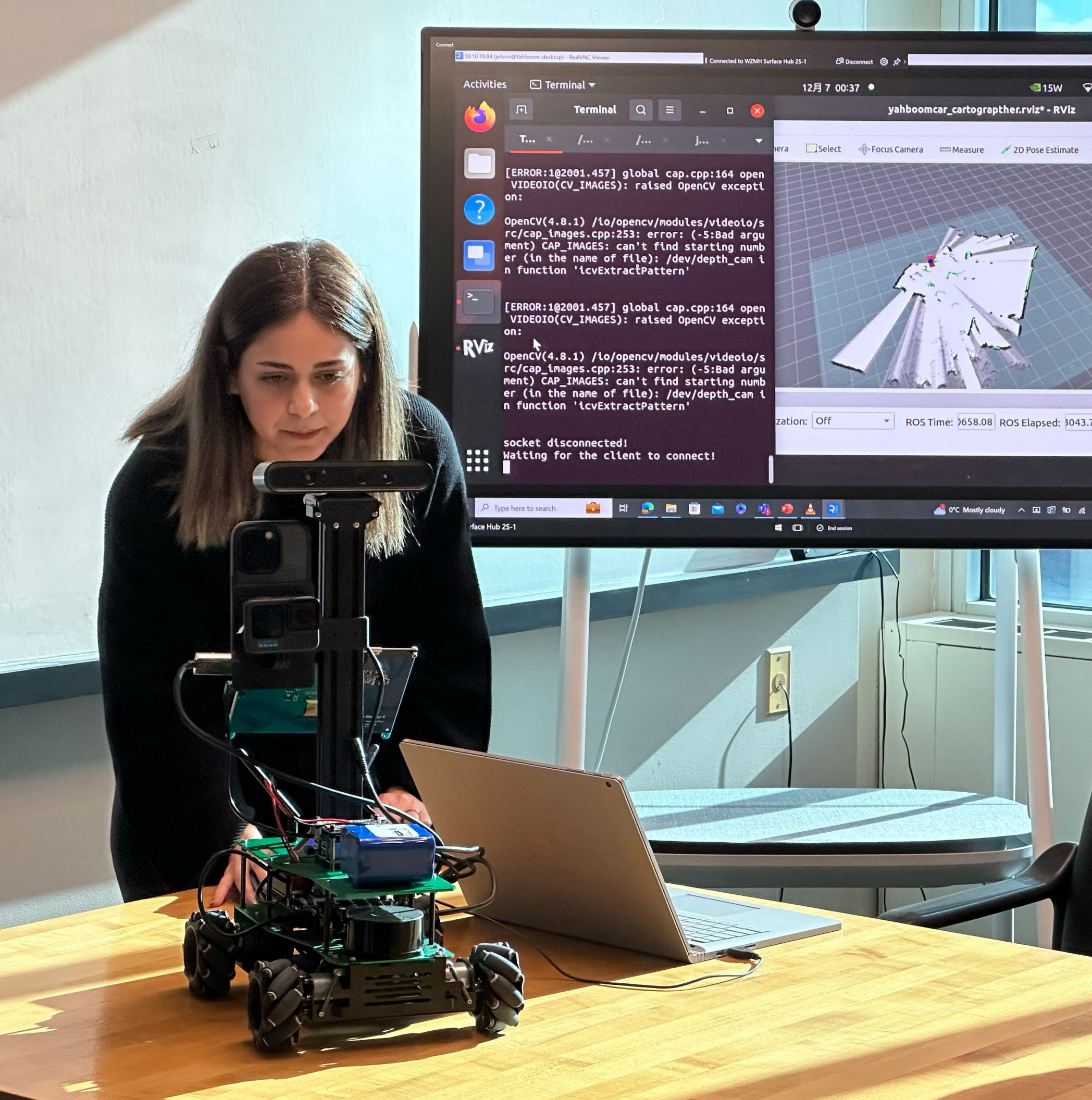# Navigate

Analyze

Optimize

VERSION 1:0

WZMH sparkbird giraffe
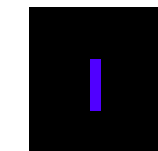
ska ana
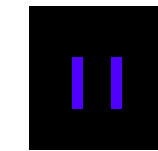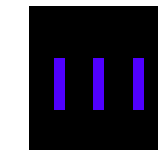
TABLE OF CONTENTS

what is ska-ana?

ska-ana is an innovative software platform designed to revolutionize the way robots navigate and analyze construction sites and existing buildings, **ELIMINATING THE NEED FOR PRE-MAPPED ENVIRONMENTS.** This advanced system automates the process of site scanning for conditions, monitoring, and data collection, significantly enhancing efficiency, reducing time and battery use, and facilitating real-time staff oversight and path adjustments.
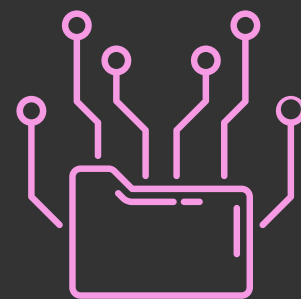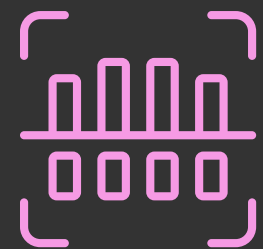
ska-ana represents a significant leap forward in construction and design technology, ensuring projects are completed with unparalleled precision and efficiency and setting a new industry standard.

ska ana

what does
ska-ana do?

ska-ana enables robots to navigate within spaces based on uploaded floor plans, with the robot's on-site activities defined by the user.

ROBOT EQUIPPED
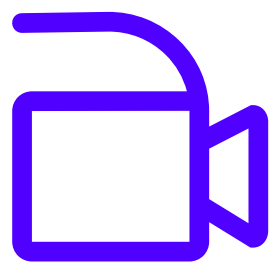
VIDEO CAMERA + **3D LIDAR** + **IR/THERMAL CAMERA** + **ENVIRONMENTAL SENSORS**
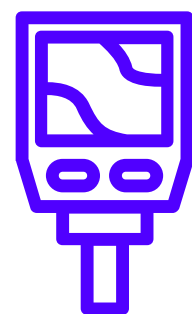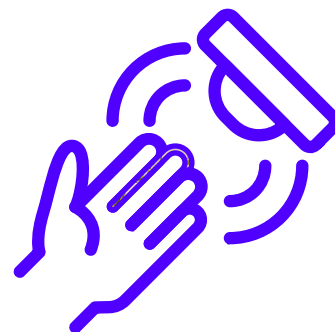
ska ana

WHAT DOES SKA-ANA DO?

The data captured can support numerous applications:

1 DETAILED CONSTRUCTION ANALYSIS

2 ENVIRONMENTAL METRICS

3 PROJECT PLANNING
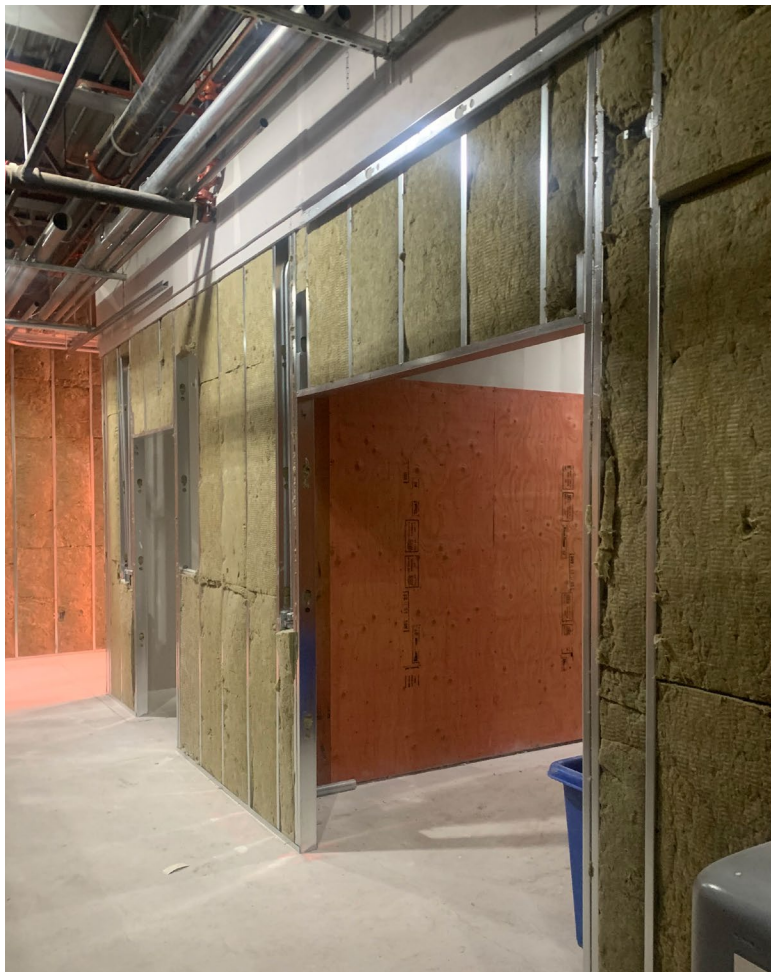
Item	Observation
Do the windows show signs of excessive heat loss?	No
Do the ceiling tiles show signs of excessive air leakage?	No
Do the exterior doors (non-public) doors show signs of excessive heat loss?	No
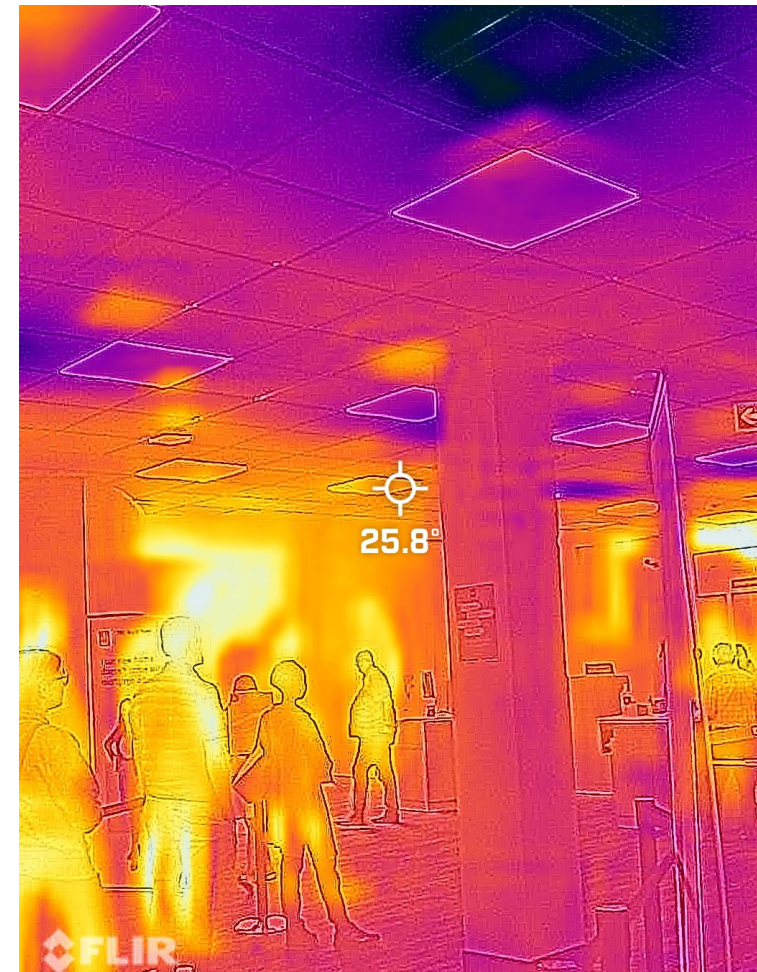
ska ana
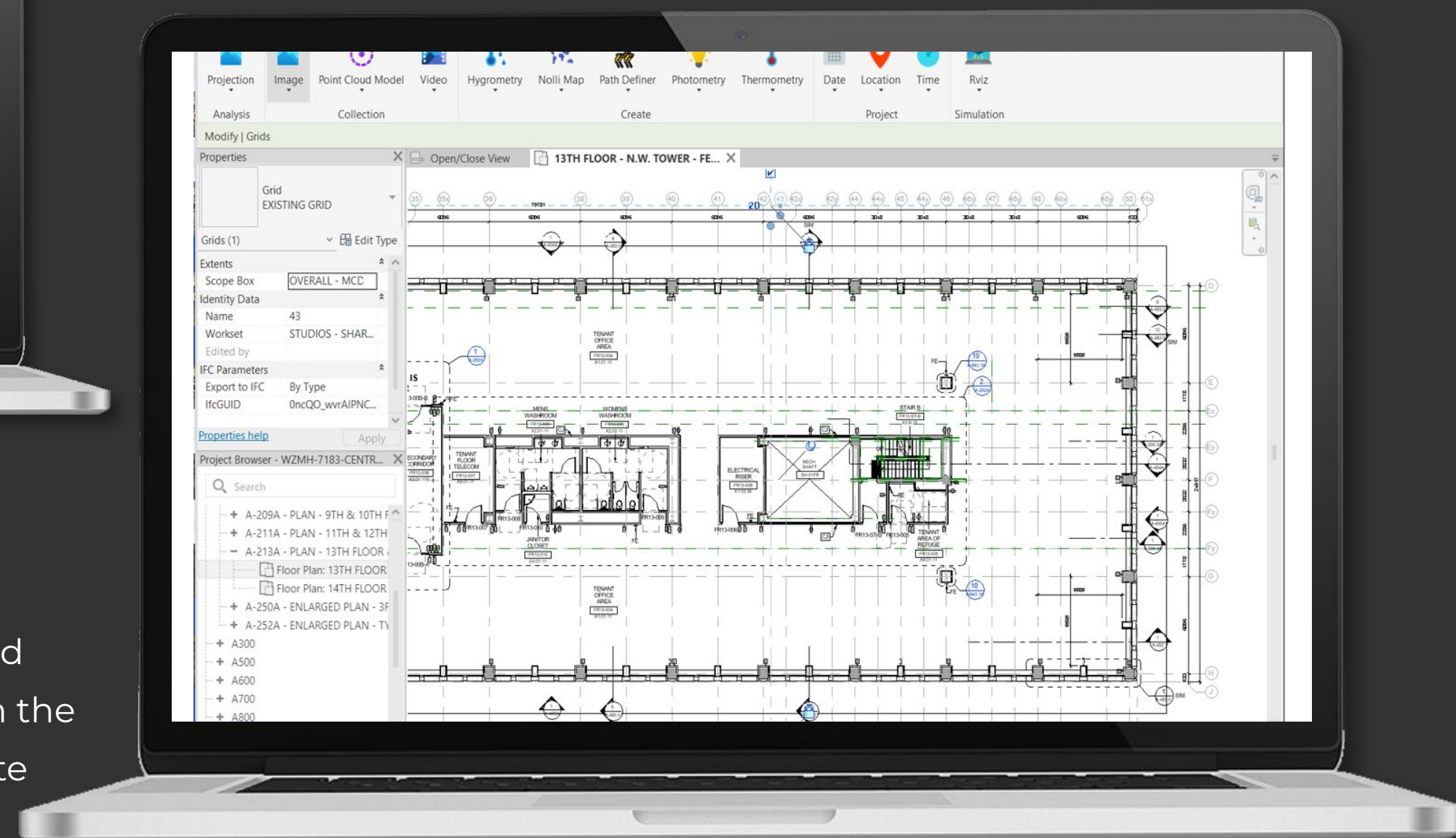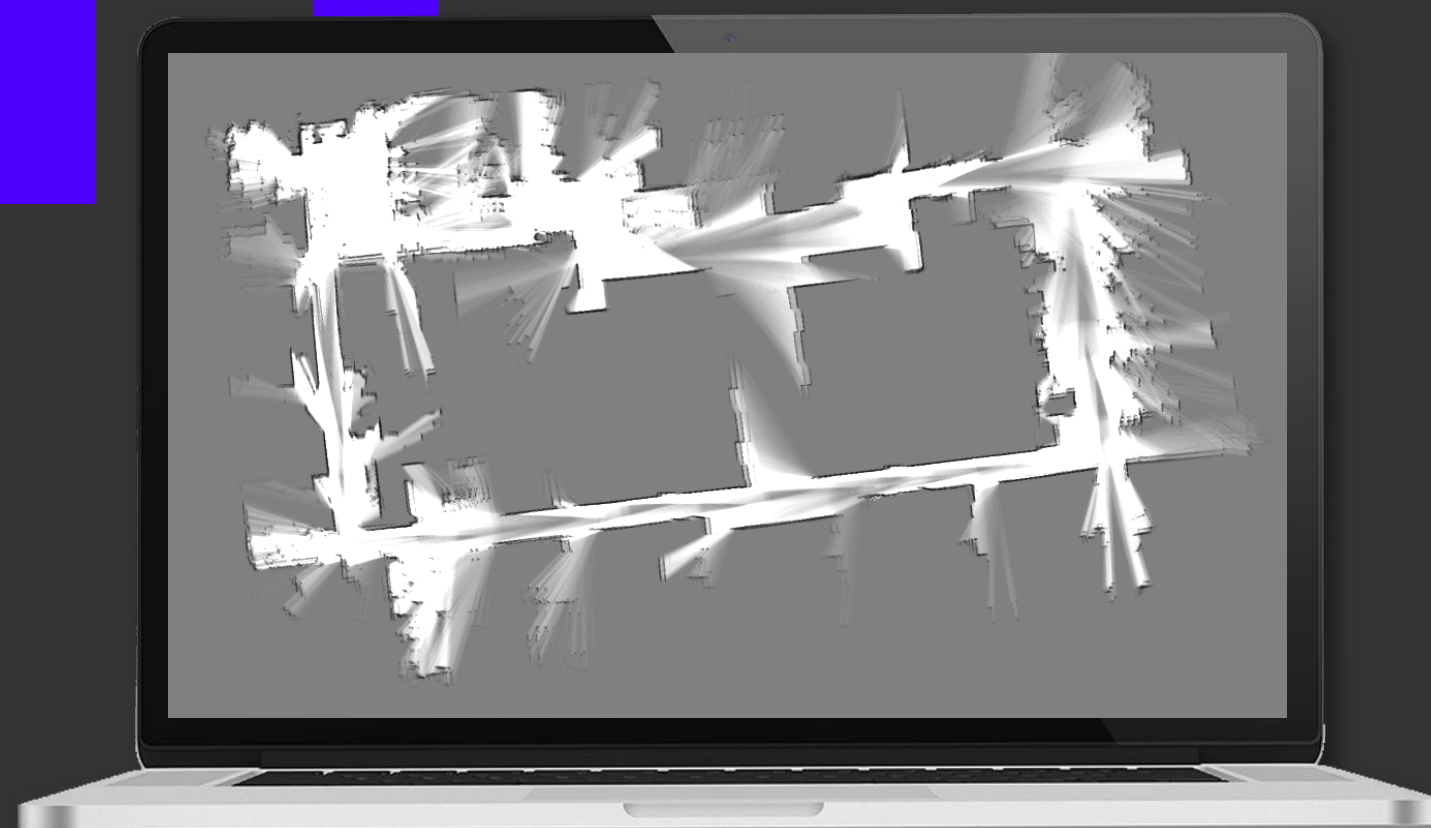
how does it work?

1 MAPPING

The **ska-ana** process begins by generating a detailed floor plan that outlines the robot's travel area, which the software then adjusts to enable the robot to navigate the space smoothly, even without prior visitation.

ska ana

how does it work?

PATH DEFINITION

In the second step, a path for the robot's travel is created using industry-standard CAD or BIM software like Revit or AutoCAD, represented by a simple line. This path not only directs the robot's movement but also specifies locations for environmental data collection.

2

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File   Panels   Help

Move Camera   2D Pose Estimate   2D Nav Goal   Interact   Select   Measure   2D Pose Estimate   2D Nav Goal

Reset
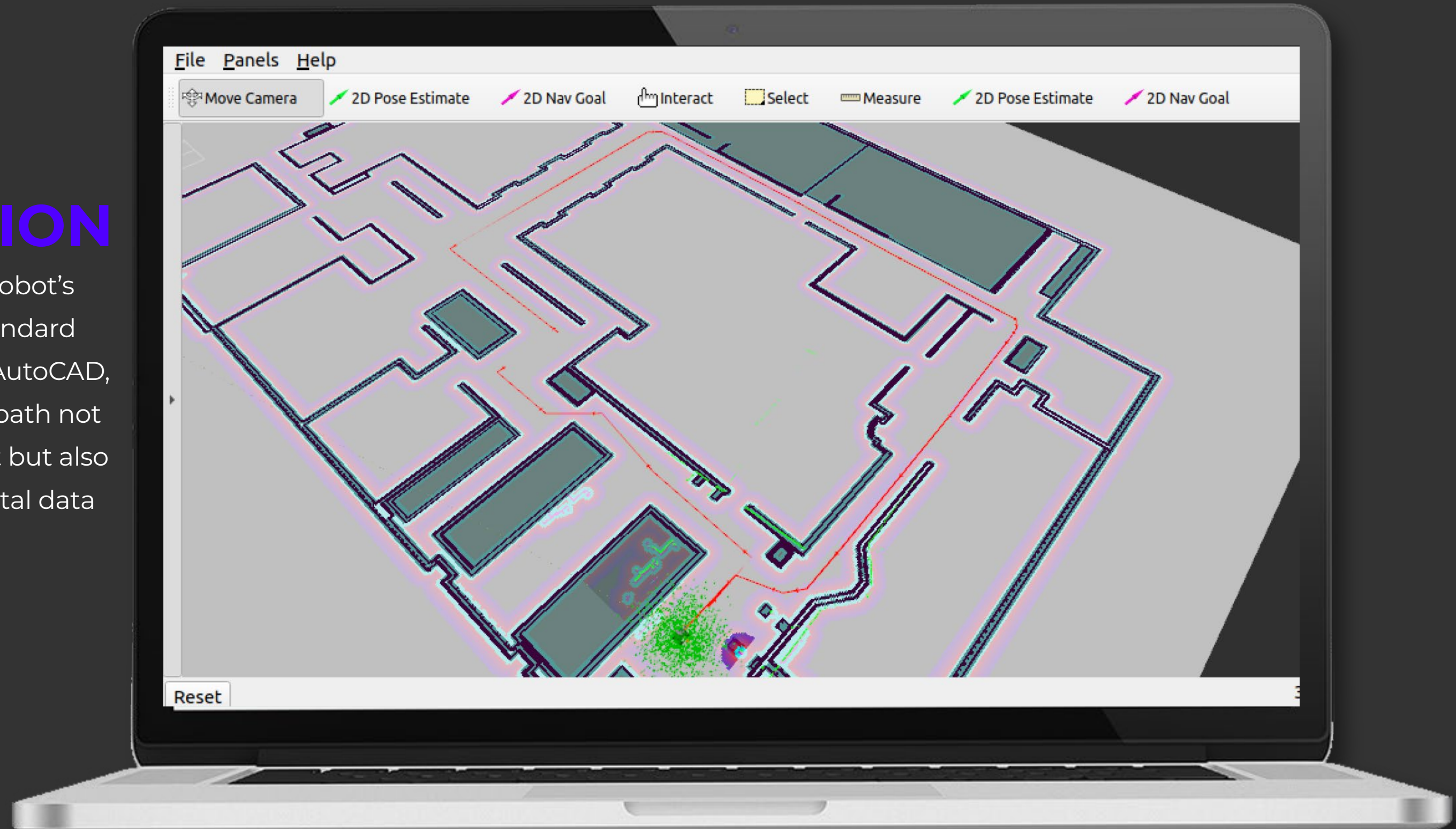
how does it work?

ENVIRONMENTAL METRICS

The third step entails gathering data along the predefined path in AutoCAD or Revit, allowing the user to selectively determine the type and locations of environmental data collection by the robot, including air quality, light levels, temperature, humidity, thermal imaging, and more.

3
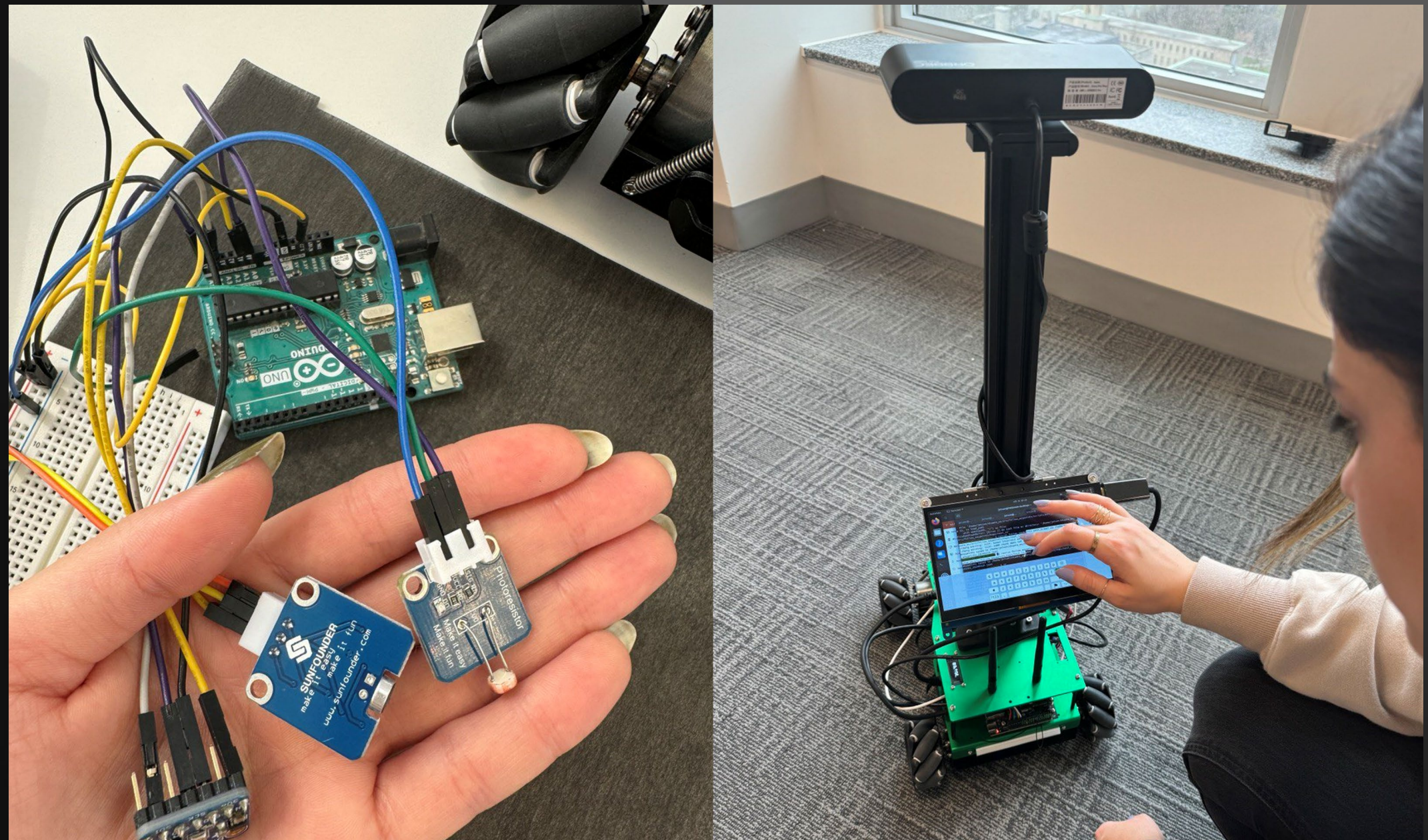
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how does it work?

NAVIGATION

The **ska-ana** software enables users to configure the robot's navigation path for autonomous operation or to manually take control, adjusting its movement, direction, and location as needed.

4

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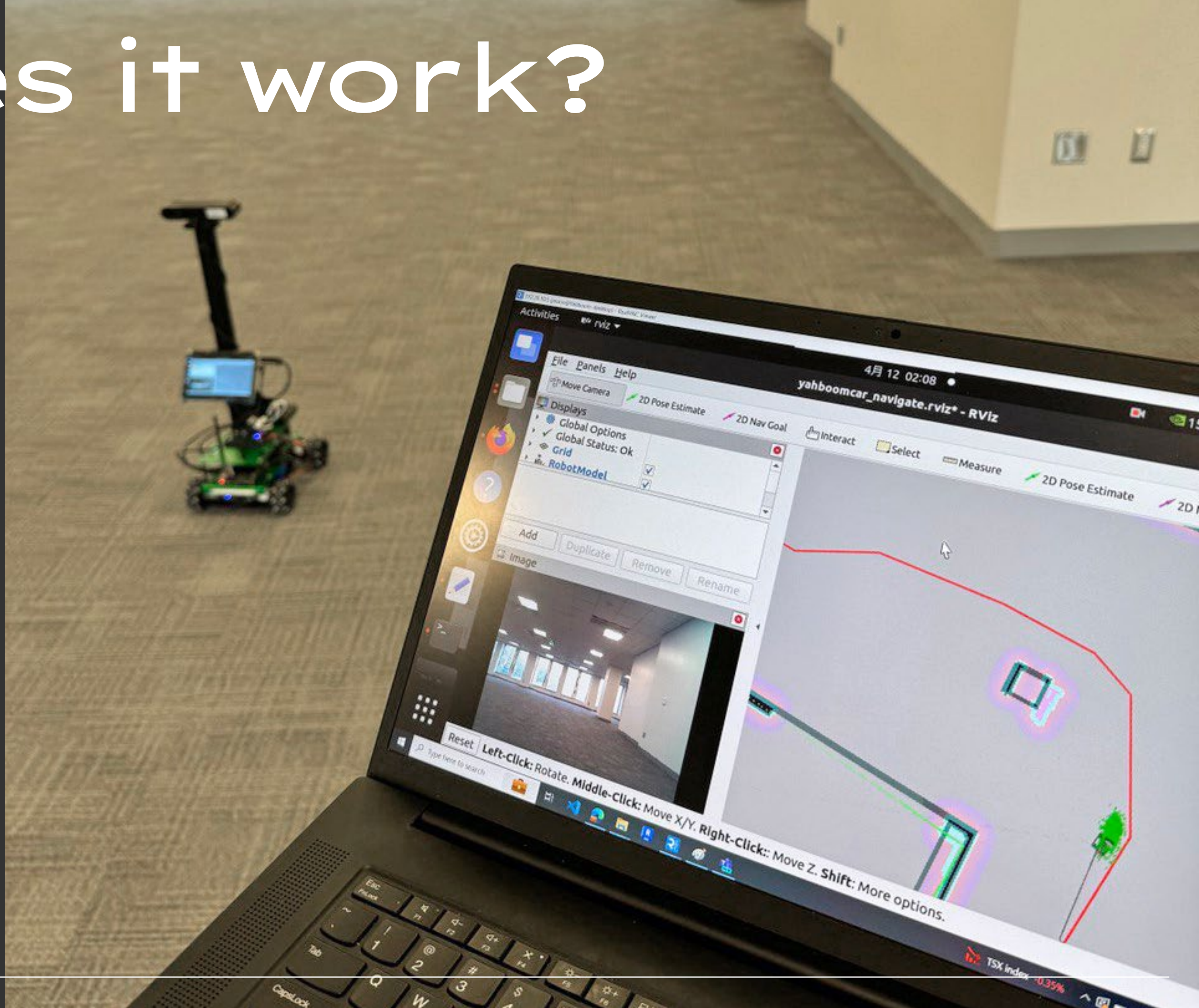
how does it work?

SCANNING, RECORDING, AND MODELING

While the robot traverses the designated path or is manually operated from a computer, its onboard hardware devices, including cameras, LiDAR, thermal cameras, and environmental sensors, capture data and transmit it back to the user for analysis.

5
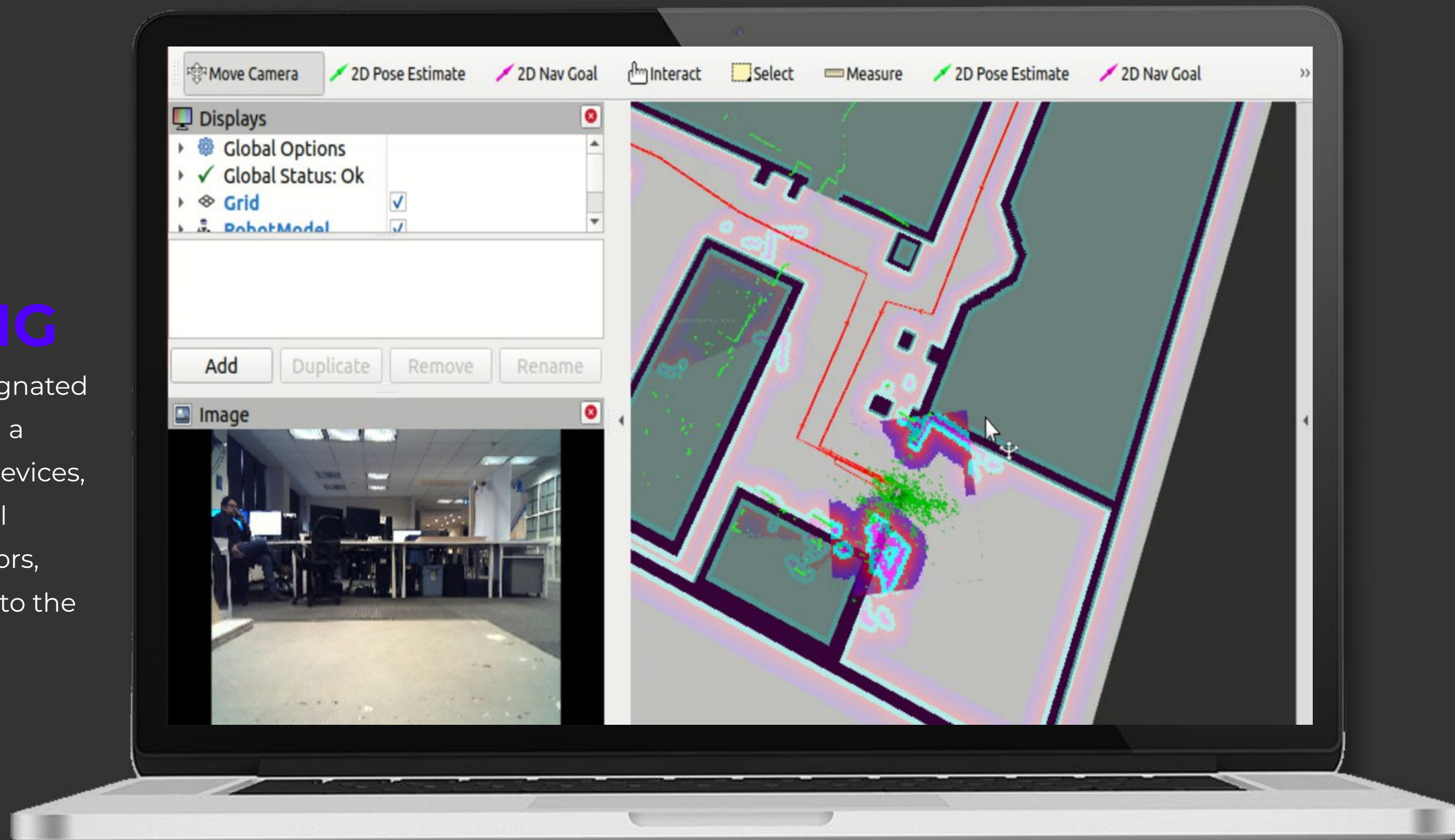
ska ana

the ska-ana advantages

ska-ana offers a transformative approach to robotic navigation in buildings yet to be explored. By precisely defining navigation paths and data collection points, it significantly reduces battery usage and on-site time, while minimizing navigation risks. Unlike traditional robotic systems that require time-consuming manual mapping or autonomous exploration, **ska-ana** bypasses these steps, directly utilizing existing building drawings for efficient operation. This leads to substantial labor savings by eliminating the need for on-site staff during the initial mapping phase.

ska-ana's ability to target specific areas for scanning accelerates project timelines and reduces the need for comprehensive space scanning. Its global applicability ensures that any **ska-ana**-equipped robot can conduct scans anywhere, avoiding the costs and logistics of robot transportation. Compatibility with Autodesk products further streamlines the process, allowing architects and engineers to easily integrate **ska-ana** into their existing workflows for targeted scanning and monitoring, essential for design optimization and construction oversight. This suite of advantages positions **ska-ana** as a key player in enhancing efficiency and precision in construction and building management.

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ska-ana for...

EXISTING BUILDINGS

ska-ana revolutionizes documentation for existing buildings by enabling precise, up-to-date conditions through robotic navigation and data collection. Ideal for architects, engineers, owners, and builders, this system accurately captures building states for renovations, maintenance, and planning, especially when the site is far from their offices. With ska-ana, a robot can be deployed using an existing floor plan to navigate and collect diverse data either 'off-hours' when vacant or during working hours with remote monitoring to manage site constraints.
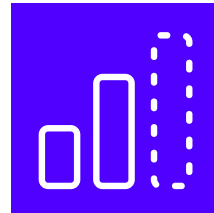
EFFICIENT AND ACCURATE DATA CAPTURE

**MINIMAL DISRUPTION, MAXIMUM FLEXIBILITY**
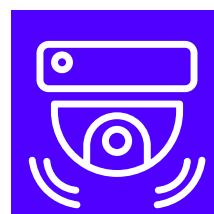
COST-EFFECTIVE AND GEOGRAPHICALLY UNBOUND

BUILDINGS UNDER CONSTRUCTION

ska-ana is revolutionizing new building construction by acting as a digital substitute for on-site inspection personnel. This innovative tool improves reporting quality and workmanship by identifying deficiencies that may elude even experienced professionals, elevating construction standards through precise, automated checks.

Data collected by **ska-ana** from construction sites enhances site safety and efficiency, allowing project teams to anticipate and mitigate potential bottlenecks before they disrupt progress. Additionally, **ska-ana** integrates with industry-standard CAD software, enabling designers, engineers, and other stakeholders to remotely navigate the robot and collect data. This feature eliminates the need for frequent site visits, allowing essential checks to be conducted directly from your desk, streamlining processes and ensuring project accuracy and efficiency.
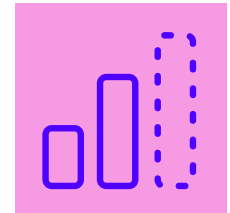
LEVERAGING AI FOR ENHANCED ANALYSIS

EFFICIENT PROGRESS TRACKING AND DEFICIENCY IDENTIFICATION

REMOTE MONITORING ADVANTAGES

ska ana

ska-ana for...

BUILDINGS POST CONSTRUCTION

SERVER HEALTH MONITORING

Detecting unusual sounds from hard drives and fans to preempt failures.

Ensuring server rack temperatures are within safe limits for optimal cooling.

COOLING SYSTEM EFFICIENCY

Checking ductwork and vents for blockages to maintain airflow.

Monitoring coolant levels and inspecting for leaks in liquid cooling systems.

Evaluating air filters for timely cleaning or replacement.

Monitoring dust and debris levels that could impair cooling efficiency.

GENERATORS & FUEL SYSTEMS

Checking for fuel or oil leaks around generator fill stations.

ELECTRICAL PANELS

Inspecting for tripped breakers.

CEILINGS

Checking removed ceiling tiles and inspecting for air leaks around ceiling devices and tiles.

Identifying water stains on ceiling tiles.

SAFETY & SAFETY EQUIPMENT

Ensuring fire extinguishers are correctly positioned and accessible.

Maintaining clear and accessible safety and emergency pathways, and exit routes.

Confirming no tools are left on floors post-maintenance.

PEST DETECTION

Using visual and infrared cameras to detect pests in critical areas like loading docks and walls with louvres.

ENVIRONMENTAL SENSORS

Continuously monitoring air temperature, humidity, light levels, and air quality, especially during generator tests.

SECURITY & SURVEILLANCE

Enhancing security with real-time video feeds and alerts.

Verifying all security doors are properly closed.

Accompanying maintenance personnel to restricted areas.

Conducting regular patrols around the facility.

GARBAGE AND RECYCLING MANAGEMENT

Detecting leaks and spills on the floor from soiled goods in the garbage and recycling rooms.

Monitoring air quality and temperature to ensure a safe and compliant environment.

Identifying waste not properly disposed of in bins and fallen on the floor to maintain cleanliness.

Detecting overflow in garbage bins to prevent unsanitary conditions.

PEST CONTROL

Identifying whether rodents have been caught in traps and checking for rodent droppings to assess and enhance pest management strategies.

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ska-ana case study

ska-ana is not just a tool but a transformative platform, offering unparalleled efficiency, precision, and flexibility in robotic navigation and data collection for the construction and building management industries.
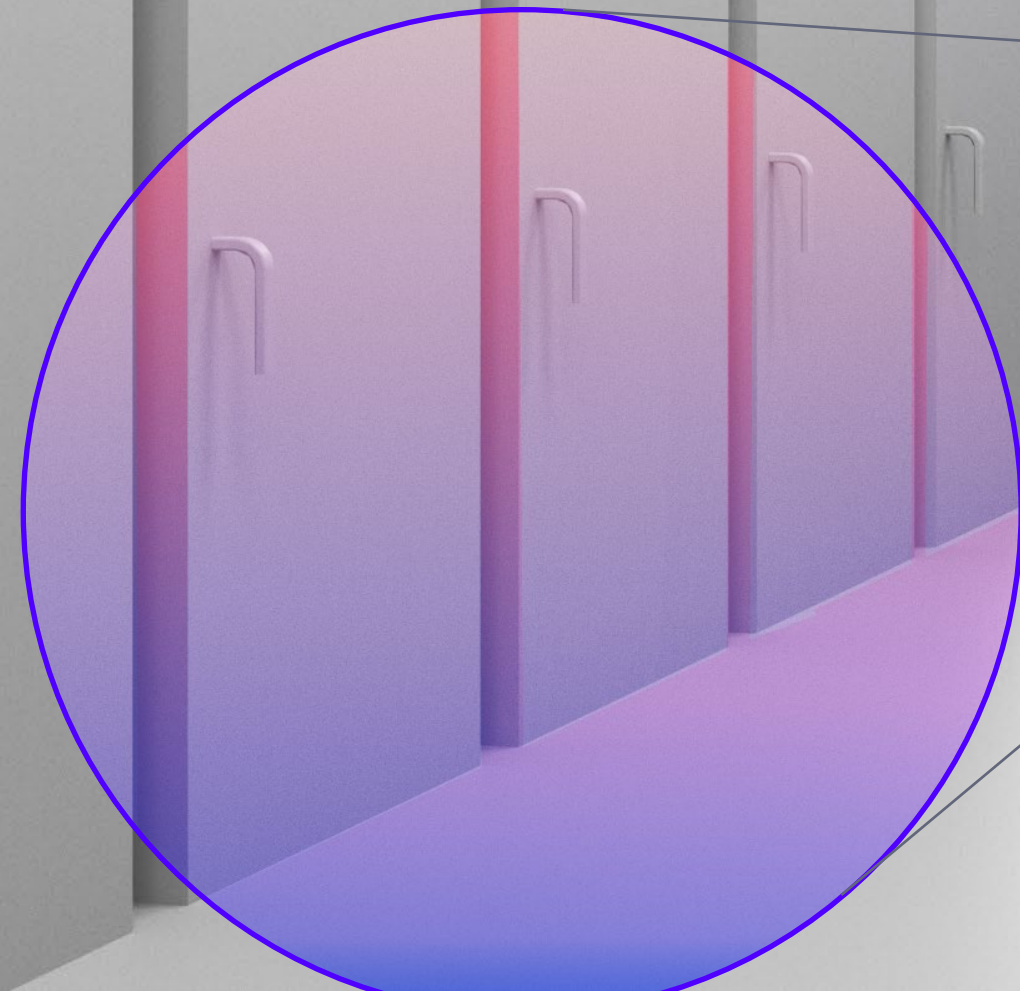
ska ana

MECHANICAL ROOM

Detects minor pipe leaks and loose insulation jacketing.

ELECTRICAL ROOM

Identifies ajar electrical panel doors, tripped circuits, heat buildup from crowded cable trays, and leaks impacting electrical equipment from overhead structures.

GENERATOR YARD

Monitors diesel fuel leaks, checks for air leakage around closed dampers and the building envelope, evaluates air quality during diesel generator operation, measures noise levels from equipment, and detects air leakage in exhaust ductwork.
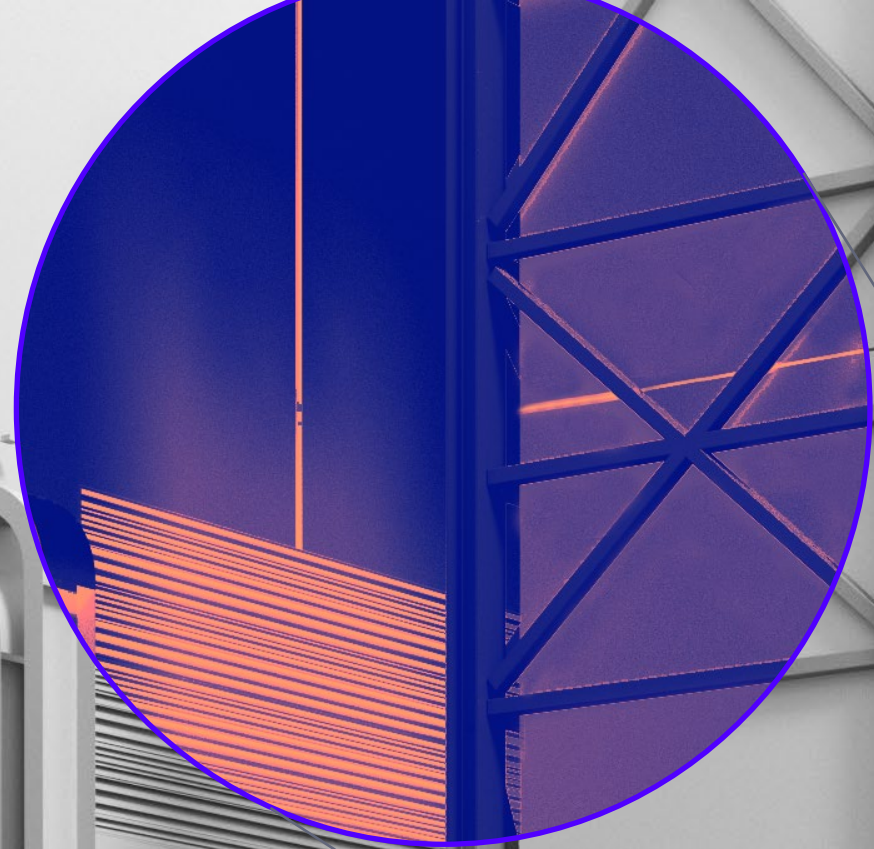
OFFICE

Uses thermal imaging to assess potential failures in window glazing spacers and seals, checks removed or leaking ceiling tiles, and monitors light levels to ensure they are appropriate for office spaces.
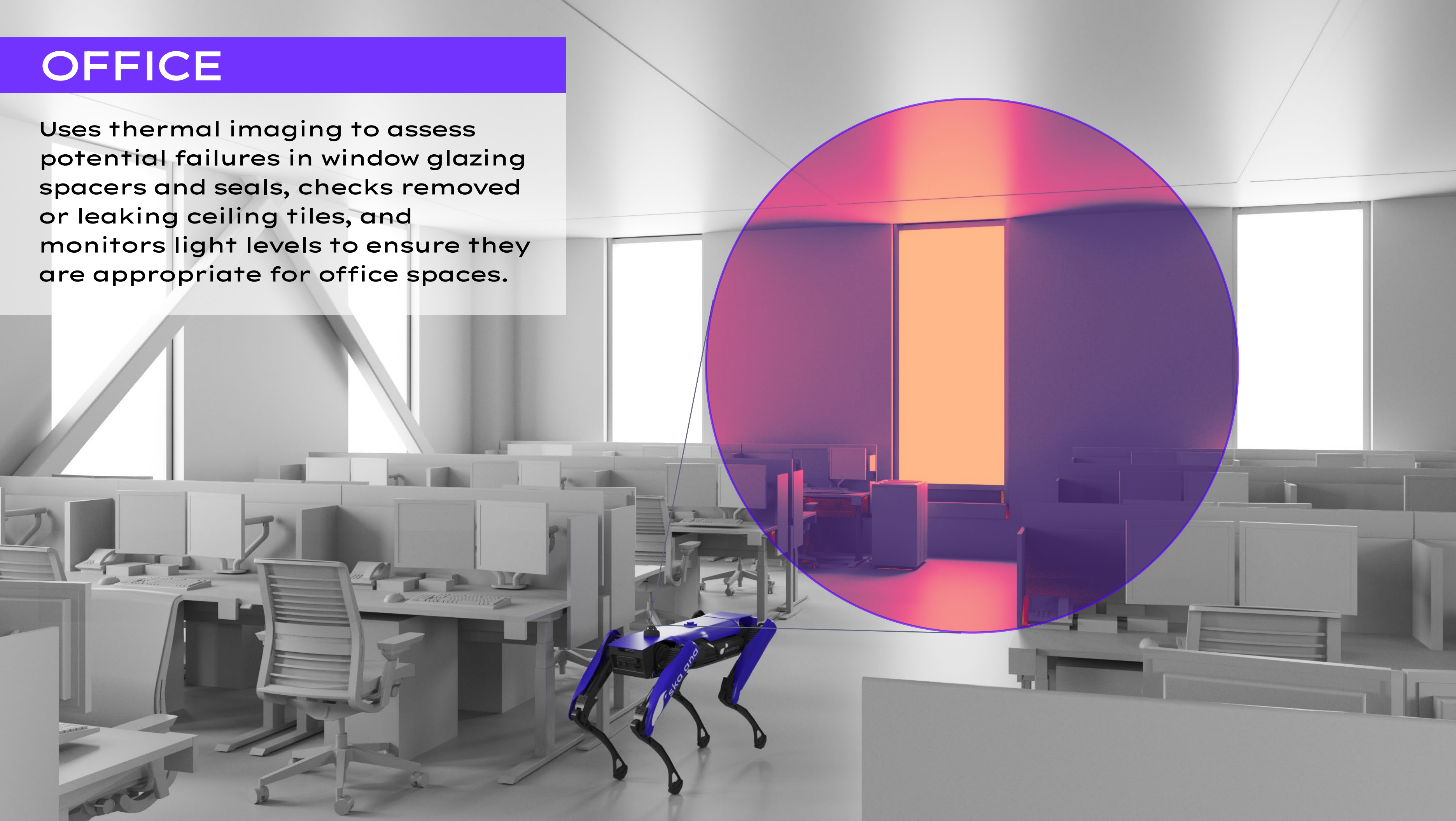
www.giraffe.software

WZMH sparkbird