THE AUTONOMOUS REPLY DRONE SOLUTION ON AZURE

Unlock business value with AI and drone technology.

We shape the **future** of **autonomous systems**

We provide high-quality solutions in AI, software development, integration and advisory services
using state-of-the-art technology and methods.

DRONE SOLUTION: 6-HOURS WORKSHOP

AGENDA AND OPPORTUNITIES

1st Session

- **Industry trends** of AI-based drone solutions
- Exploring **Microsoft Azure** offering and its benefits
- **Business** and **use-case** examples
- Where are **you now**

2nd Session

- Tailor **Microsoft Azure & Autonomous Reply** offering to your specific scenario
- Define journey to **your AI-based drone solution** together
- Valuable **insights** and consulting to achieve **your goals**

Your Benefits

- **Automate tasks** across various use-cases including industrial inspection, public safety and monitoring
- **One-stop shop**: fully integrated end-2-end AI-powered drone solution
- **Data sovereignty:** data and models hosted your Azure subscription
- **Take advantage** from Azure's rich toolkit and Autonomous Reply's expertise

DRONES ARE CONQUERING INDUSTRY

Autonomous Reply your partner achieving your business goals

REPLY AUTONOMOUS

Status Quo

- Flights are performed manually
- Onsite Pilot required
- Manual data analysis

→ High cost of data collection with Drones

Challenges

- Integration of different systems
- Cover all regulatory rules
- Need of cost-reduction

Goal

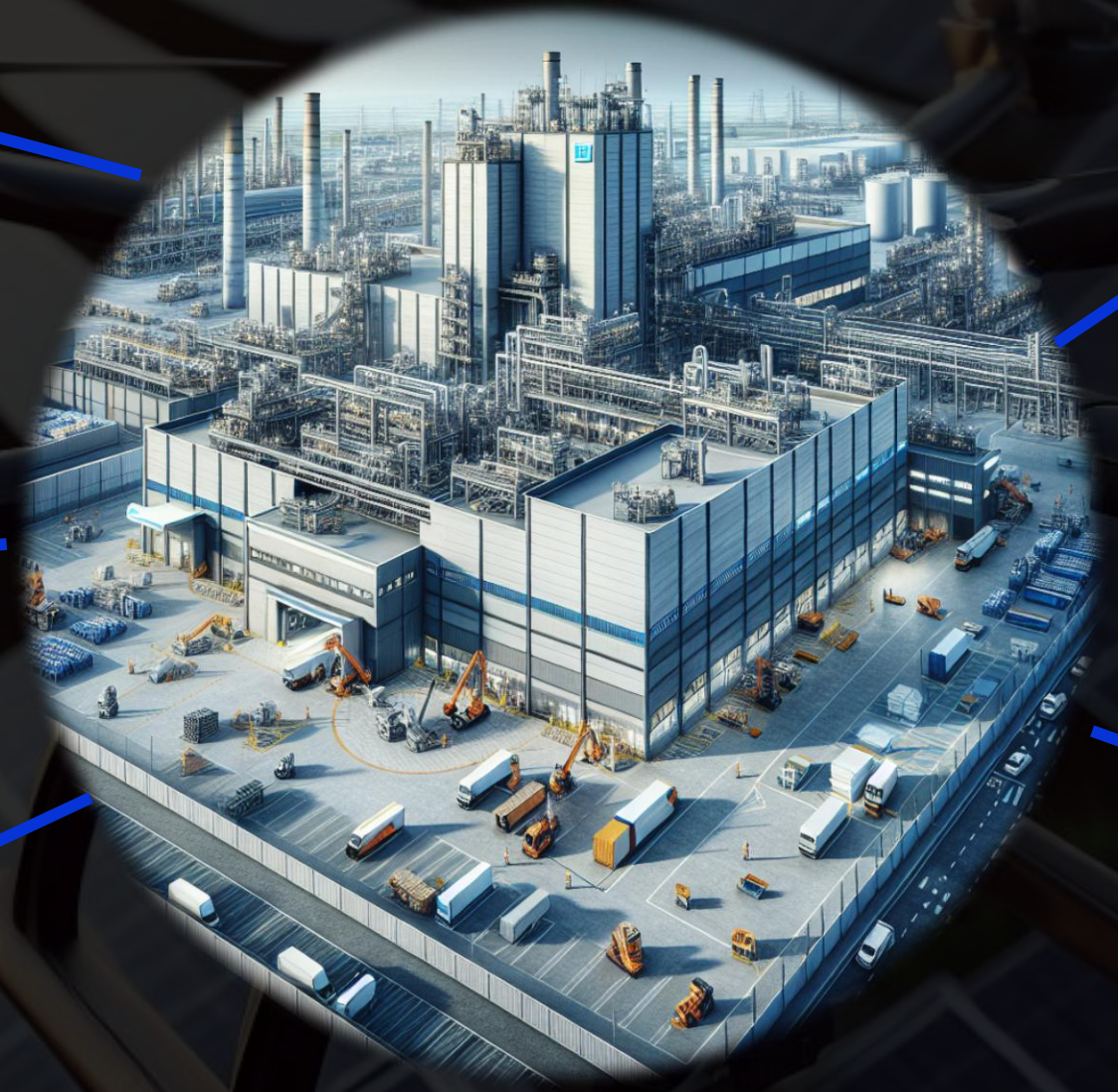
- High degree of automation
- Data sovereignty
- Shorter reaction time and higher availability
- Improved reliability

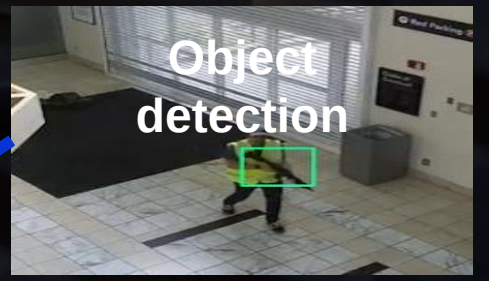
→ Huge business impact

Approach

- Fully integrated end-2-end AI Drone Solution
- DJI Flighthub hosted on Azure
- Fully integrated AI-based Analytics pipeline on Azure

DRONES IN PUBLIC SAFETY





THE AUTONOMOUS REPLY DRONE SOLUTION

Our flexible architecture allows easy extension with new capabilities for additional use-cases

Customer Ecosystem

Customer Areal

Drone and Hangar at Customer Location

Customer IT system

Flightmanagement & Realtime AI Framework (hosted in Azure)

Multi Use Case Solution

Unlock the full potential of our versatile drone solution, seamlessly combining multiple use cases into a comprehensive drone ecosystem that addresses all your needs.

- **Patrolling and Surveillance**
- **Fence Surveillance**
- **Road Condition Monitoring**
- **Solar Park Inspection**
- **Search & Rescue**
- **Forest Fire Detection**
- **Indoor Inventory Management**
- **Outdoor Vehicle Localization**

REFERENCE USE-CASES

Patrolling and Surveillance

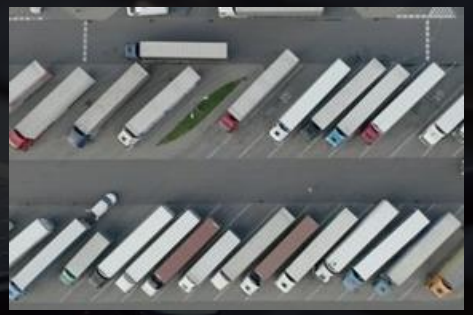
- Real-time surveillance
- Planned missions
- Scheduled patrol flights
- AI-based object detection
- Detection of intruders, anomalies and damaged fences

Outdoor Inventory

- AI-powered drones autonomously count outdoor inventory in industrial areas.
- Real-time data transfer enables accurate stock tracking and planning

Fence Surveillance

- Autonomous fence condition monitoring
- Defect detection of damages and holes
- Identification of intruders
- Alarm activation



Outdoor Vehicle Localization

- Real-time tracking of vehicle position
- Vehicle recognition through QR code
- Damage detection and report
- Integration in customer system without need of manual information submission

Dynamic Warehouse Optimization

- AI-powered drone swarms analyze and optimize warehouse layouts in real time
- Identification of underutilized or congested areas
- Automated suggestions for product relocation to improve efficiency
- Continuous monitoring for adaptive space management

AUTONOMOUS DRONE SOLUTION

A fully-automated and integrated drone solution providing value across multiple use-cases that can be deployed anywhere

24/7 operations

Azure

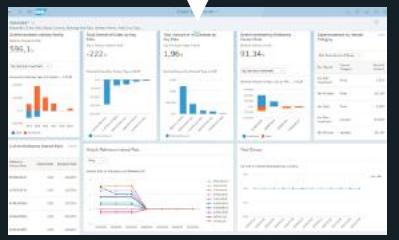
Flight-management

Data Analysis & AI

Customer ERP

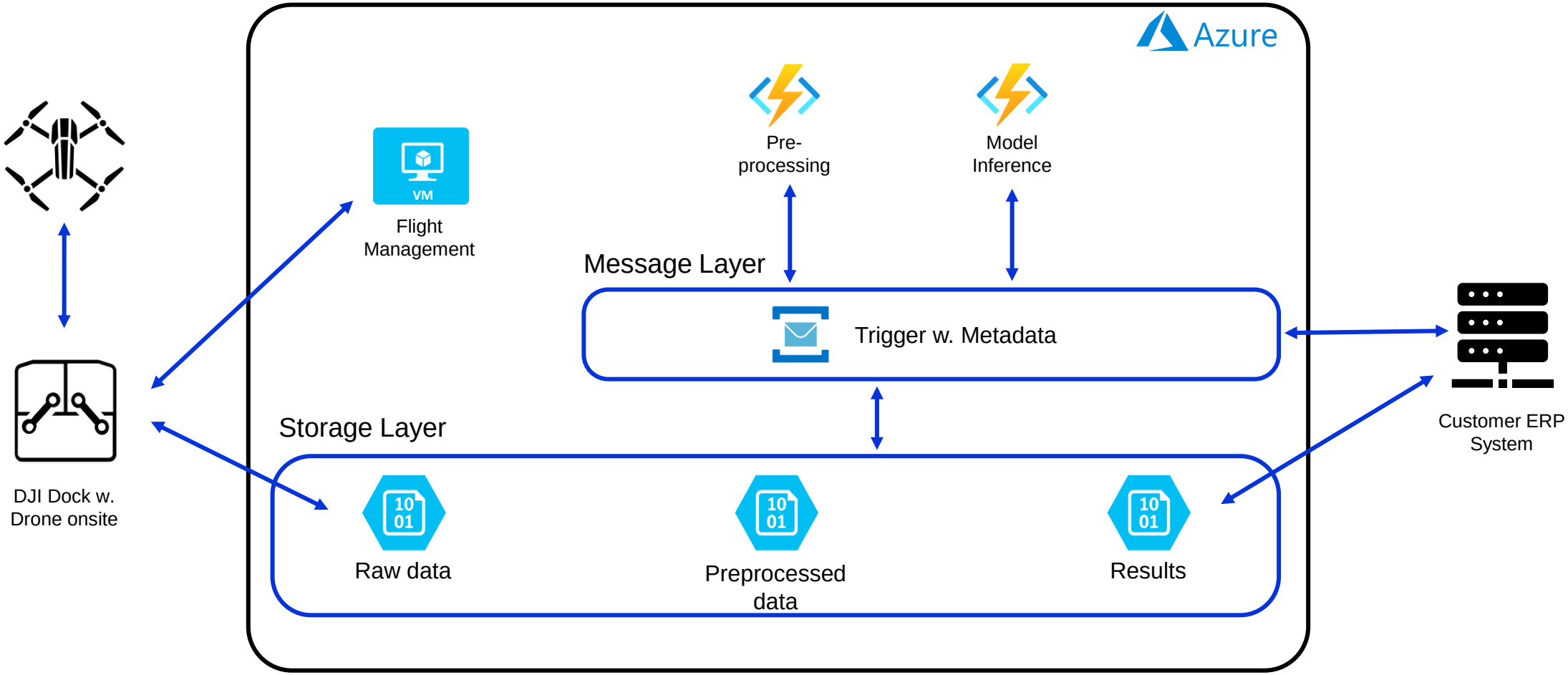
Remote Pilot

Situation Center



User Interface

SOLUTION ARCHITECTURE



EXAMPLE: RESULTS PERSON DETECTION

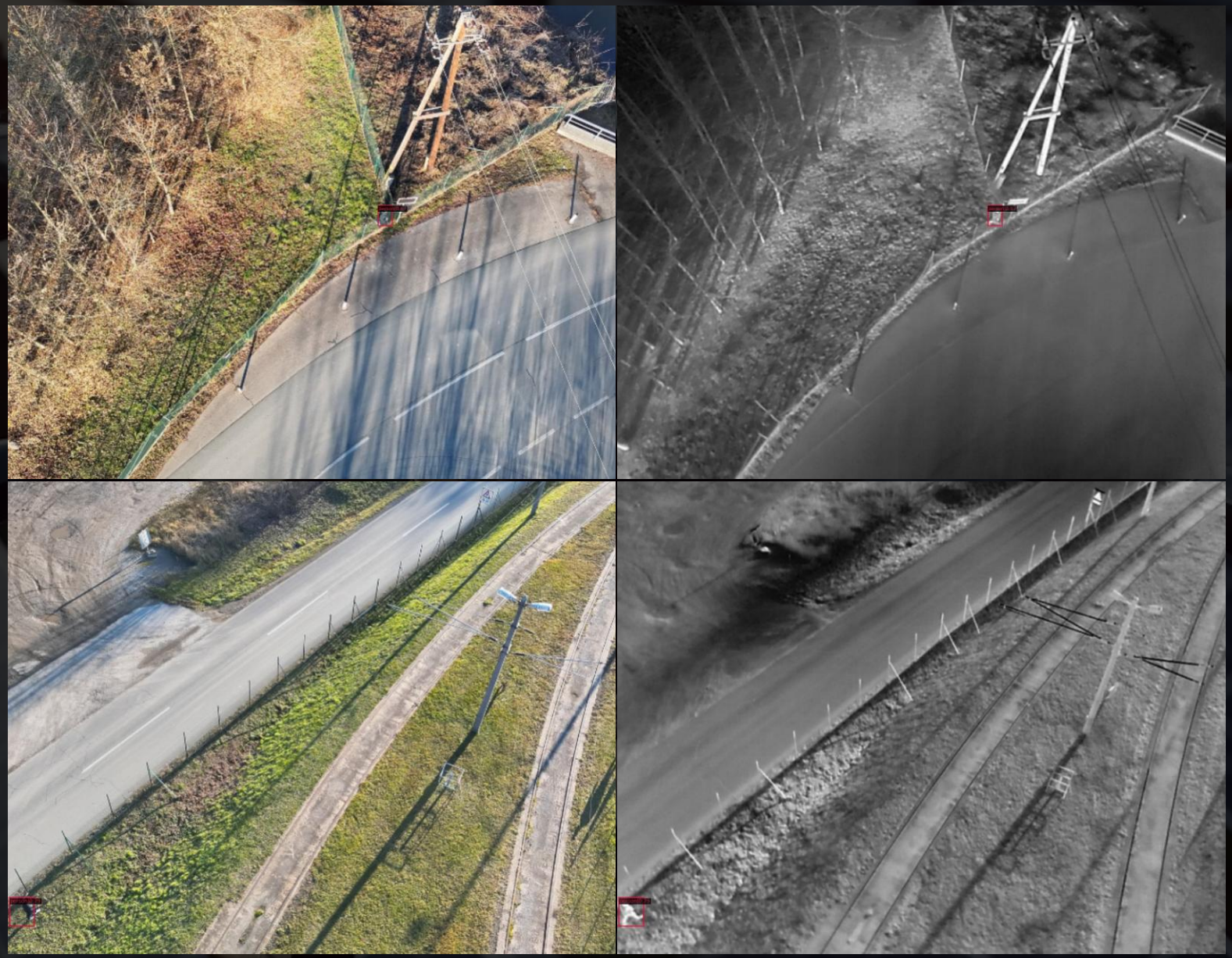
Person detected at the fence

Person detected hiding behind objects

Results from one of our customers using a DJI Dock2 with M3DT and our AI pipeline

EXAMPLE: RESULTS PERSON DETECTION

Persons can be detected also from a very high distance



Results from one of our customers using a DJI Dock2 with M3DT and our AI pipeline

EXAMPLE: RESULTS PERSON DETECTION

Thanks to the overlay of RGB and thermal camera images, persons are also detected in low light conditions

Results from one of our customers using a DJI Dock2 with M3DT and our AI pipeline

BENEFITS OF OUR SOLUTION AT A GLANCE

Data Sovereignty
- Hosted in your own Azure subscription

Efficient data provision and processing
- No manual data transfer via SD cards required anymore

Real-time transmission
- Livestream sharing with all involved parties

Central control station
- Optimized coordination of all drone systems in the fleet
- Remote control and autonomous drone missions

AI functionalities
- Automated, AI-based data analysis
- Optimized AI skills for each use case

Optimization
- One drone system for a variety of use cases

Increased efficiency
- Through reduction of workforce

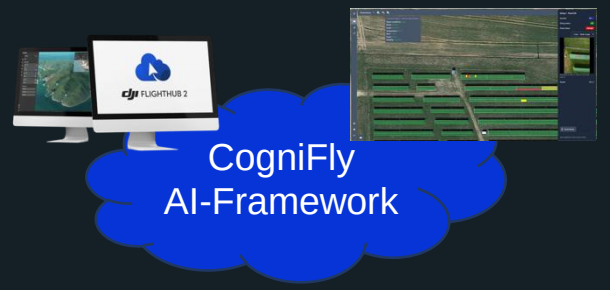
Technology Partner

DJI, a leader in the global drone industry

ENTERPRISE GOLD PARTNER

Autonomous Reply as Enterprise Gold Partner is your go-to expert for drone solutions and system integration.

DJI Dock2 with DJI Matrice 3TD



OUR OFFERING AI-BASED DRONE SOLUTIONS

End 2 End Autonomous Drone solution

Providing HW and Integration

Regulatory Advisory and Training

AI Model Development and Analysis

Drone Operations (Pilot as a Service)

MISSIONFLIGHT - OBJECT DETECTION AND AI

COMPUTER VISION POWERED AI | OBJECT DETECTION

INDUSTRY: ENERGY & UTILITIES

> *This project aims to enhance security and operational efficiency through AI-driven drone support. This initiative involves multiple work packages, including the development of use cases for perimeter security, parking area monitoring, and open door detection. The project includes support for a data pipeline for AI processing. The collaboration leverages AI technology to provide real-time data analysis and actionable insights, ensuring that all technical issues are clear and processable.*

CHALLENGES:

Ensuring the accuracy and consistency of the labeled data. This process often requires a significant amount of manual effort, which can be time-consuming and prone to human error. Integrating advanced AI-driven drone support with existing systems can be complex. Ensuring seamless communication between the drones and the company's infrastructure requires meticulous planning and execution. The project involves collaboration between multiple departments and stakeholders.

SOLUTION:

The fusion object detector for people detection in this project works in both day and night conditions. It uses diverse training data, transfer learning, and adaptive techniques to adjust to different lighting conditions, continuously improving its accuracy and reliability over time.

TECHNOLOGIES: PYTHON | MACHINE LEARNING | GIT | AZURE

DRONE BASED WAREHOUSE INSPECTION

EDGE COMPUTING | DRONES

INDUSTRY: LOGISTICS & MANUFACTURING

> *In this project, we develop and deploy an autonomous drone-based system for indoor warehouse and manufacturing inspections. The system leverages an advanced VSLAM algorithm for real-time localization and mapping, coupled with sophisticated navigation and control systems allowing for autonomous operations. Designed to operate within confined indoor environments, the solution offers customers the flexibility to perform real-time inspections with just a few clicks.*

CHALLENGES:

The primary challenges involve implementing a robust vision only based SLAM solution that while ensuring precise localization and control in a confined indoor space. The industrial nature of the inspection area means that the drone must be able to navigate through a highly dynamic and complex environment. In addition to the reliability of the state estimation, the following steps in the pipeline such as path planning and control must be real-time capable.

SOLUTION:

The inspection area is initially mapped using a 3D camera. A VSLAM algorithm estimates the drone's state in this map. A navigation algorithm calculates the flight path based on the drone's position and inspection goal. A controller generates control commands from this data. After the mission, the drone returns to its landing site. Missions are executed on a simple UI.

TECHNOLOGIES: PYTHON | ROS | C | SLAM

GET IN TOUCH!

REPLY AUTONOMOUS

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Autonomous Reply is the specialized unit within the Reply Group for AI-powered autonomous systems. Through strategic technology partnerships with DJI and NVIDIA, Autonomous Reply provides companies with comprehensive consulting services as well as tailored software development for the implementation of AI-based functions and products.
The company supports customers from various industries, including automotive, logistics, and mechanical engineering, with a diverse range of services – from the development and integration of autonomous systems, such as those based on drone technology, to scaling in productive environments. The scope of services includes optimizing development processes, implementing customized solutions, and seamlessly integrating them into existing IT and production landscapes.