TINAMU

Your partner for precise, digital, fraud-free and real-time inventory monitoring

Tinamu Labs AG | Thomas Götschmann
thomas@tinamu.com | +41 79 740 88 80

Spinoff ETH zürich VENTURE KICK +AWARDED COMPANY+ by

Precise, digital, fraud-free & real-time data

RMS light = plug & play LiDAR kit on drone or as handheld for bulk inventory monitoring

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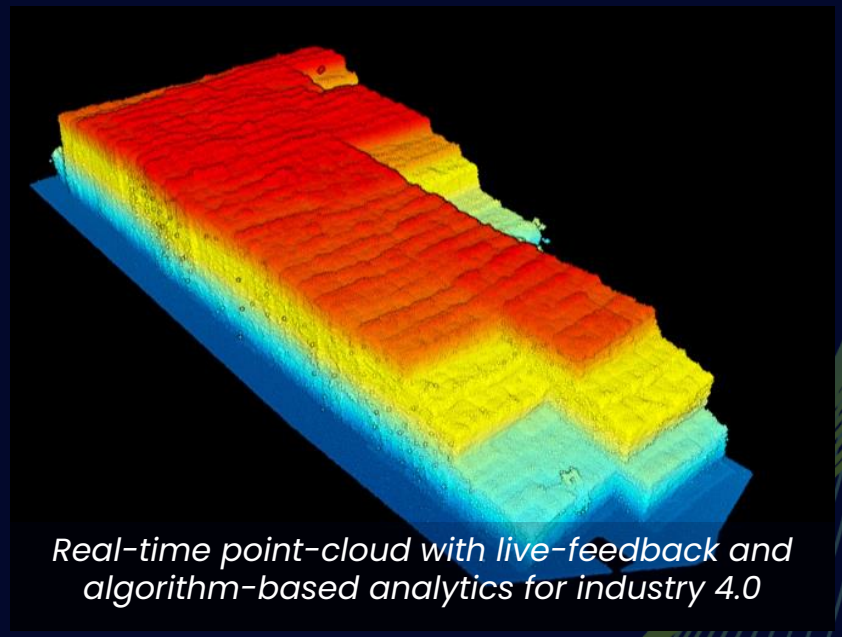
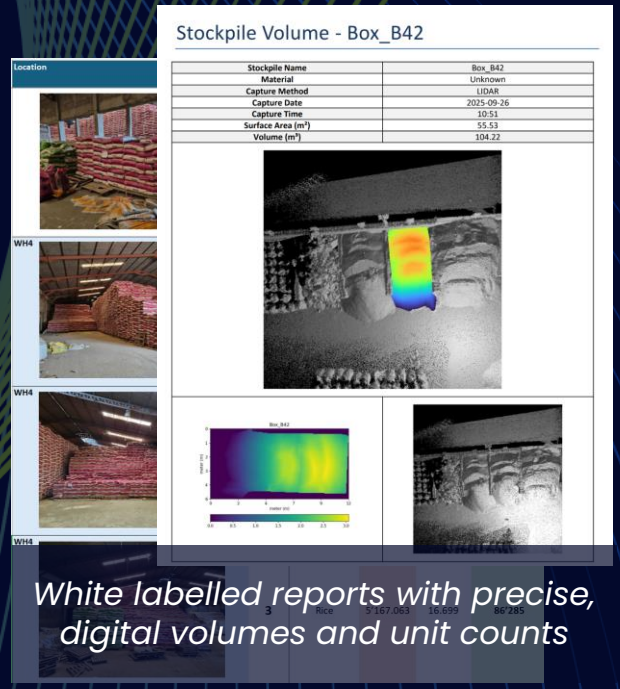
Equipment & Support + **Advanced analytics** = **Results ready to share**

Immediate self-scanning of inventories with remote training, no installation nor CAPEX



Real-time point-cloud with live-feedback and algorithm-based analytics for industry 4.0



White labelled reports with precise, digital volumes and unit counts

Note: TINAMU RMS light kit is compatible with any dji Mavic 3E/T or Matrice 4; as for a quote to make it available for any further drone or robot

TINAMU RMS light proven in tough environments

"Tool" for precise digital inventory monitoring

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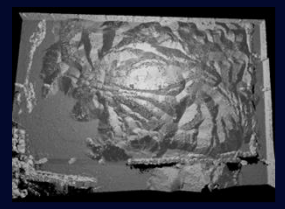
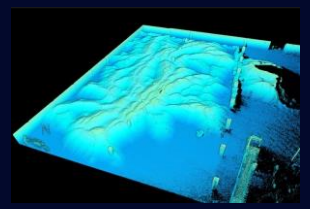
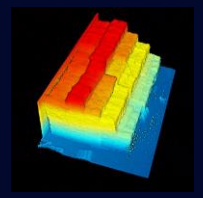
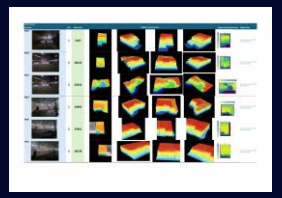
Commodities in bulk

Commodities in bags or as units

- ✓ Up to 6x faster inspections with 10x lower cost
- ✓ Precision (99% accuracy) & real-time (<2h scan to results)
- ✓ Digital twin with no local installation nor investment needed

- ✓ Safe & efficient (no walking over materials & no operational stops)
- ✓ LiDAR (360° & 40m range) developed for dusty environments
- ✓ Successfully tested & used globally in Europe, Africa, Brazil & Canada

- ✓ Precise, digital, fraud-free & real-time data with drone or handheld
- ✓ Volumetric measuring and unit counting with algo-based analytics
- ✓ White-labelled report for metals, fertilizers, coal, rice, sugar, etc.

TINAMU RMS light offering for digital inventory monitoring

Advantages

- ✓ Precise, digital and fraud-free inventory data
- ✓ Real-time digital twin in- & outdoor with no GPS
- ✓ 6x faster inspections on drone or as handheld
- ✓ Immediate use with no installation nor CAPEX
- ✓ Algorithm-based analytics (volumes, units, etc.)
- ✓ Trusted data via reports, dashboard or APIs

Specs

- Developed for dusty environments & accuracy (>99%)
- Safe & efficient (no site disruptions & 10x lower cost)
- 360° LiDAR plug&play kit for dji Mavic 3E/T or M4
- 15'+ flight time with 40m reach (10Hz + 200k points/s)
- Class 1 laser safety (eye safe)

TINAMU RMS light rent LiDAR plug & play kit on drone with live point cloud
CHF 299 per month[1] (handheld option: + CHF 49)

Cloud - Inspector
- Aligned point cloud
- Single volume monitoring
- Unlimited scans

CHF 199 per asset per month (yearly subscription)

Cloud – Site
+ Segmentation (multiple material monitoring)
+ Counting
+ Fraud detection

CHF 399 per asset per month (yearly subscription)

Cloud – Enterprise
+ Density reconciliation
+ 24/7 support
+ Dashboard & APIs

CHF 999 per asset per month (yearly subscription)

Cloud – Inspection support
- CHF 500 per inspection at any asset
- Bundle of 10 inspections for CHF 4'000

Spot inspection support with TINAMU pilot
- *One time inspection CHF 2'500 per site[2]*

1. Yearly subscription (50% due as prepayment) incl. HW and SW updates without drone (compatible with: dji Mavic 3E/T or Matrice 4); Price for purchase = CHF 2'999 (+ handheld option CHF 499).
2. Excl. travel and expenses to be invoiced as occurred

Note: 1 asset = 1 warehouse (4 walls & 1 roof >2500m2) or 1 silo / vessel or connected outdoor area; Price incl. remote training & support, data processing & result creation, excl. taxes & shipping

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Trust Through Technology for your customers

Baseline for continuous improvement and production excellence

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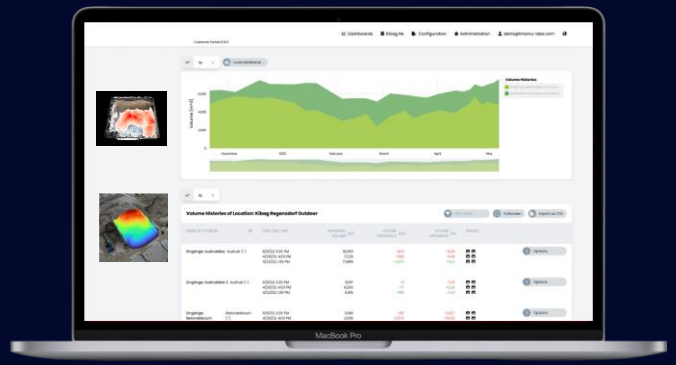

Accurate, standardized and trusted data for

- ✓ Planning accuracy
- ✓ Cost efficiency
- ✓ Logistic and Production excellence

PURCHASING & SALES

- Know what can be sold
- Know when to buy what

PRODUCTION & LOGISTICS

- Accurate planning
- Optimized operations

REPORTING & FUNDING

- Reliable automated data
- Reduced risk exposure

TINAMU

Thomas Götschmann
Late Co-Founder & CEO

Driven to build a deep-tech solving real customer problems

Let us to build together

Trust Through Technology

WINNER 2024 Commodities INNOVATION AWARDS TECHNOLOGICAL INNOVATION AWARD

Contact us:

Tinamu Labs AG | Staffelstrasse 10 | 8045 Zurich
Thomas Götschmann | thomas@tinamu.com | www.tinamu.com

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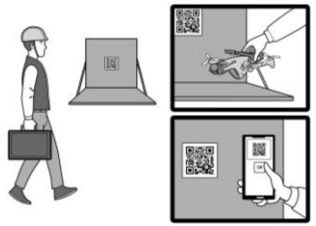
TINAMU Robotic Monitoring System (RMS)

Two Products Indoor & Outdoor

Automated Flight = RMS



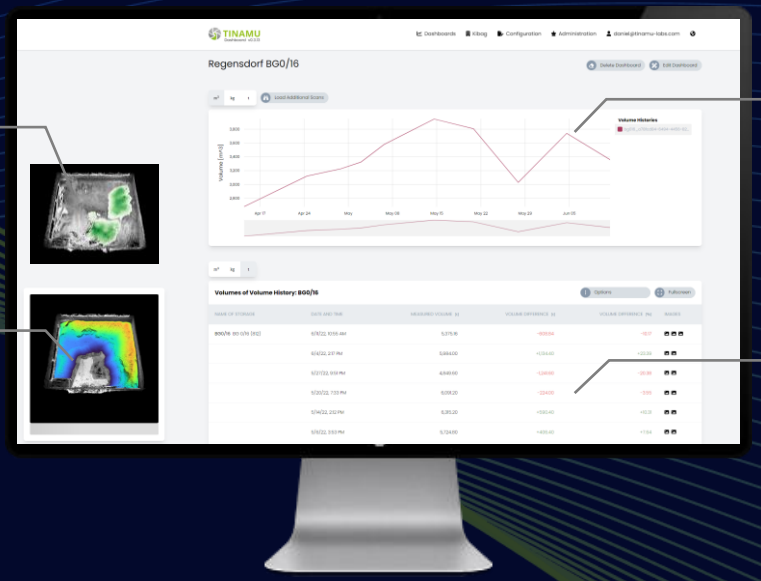
~6-12h to Data

Manual Flight = RMS light

~1-2h to Data

Material Difference

Material Distribution



Inventory trendline

Detailed inventory for each stockpile

SWISS precision for GLOBAL application

Selection of customers

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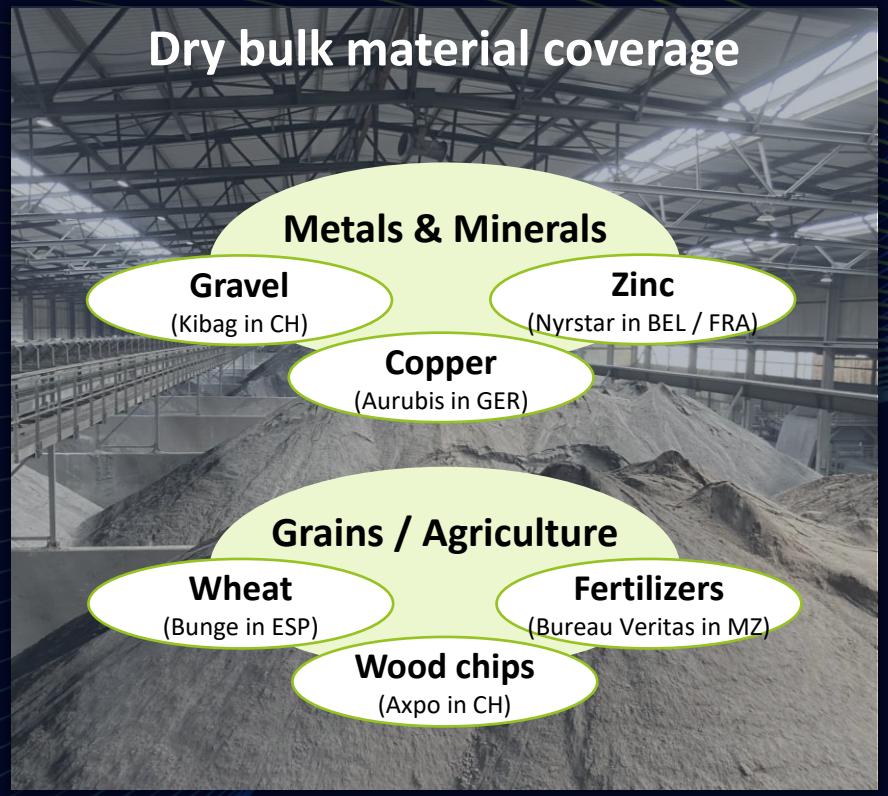

Strong momentum in 2025

Spot inspections

IMERYS · YARA · BUREAU VERITAS · MOZAMBIQUE FERTILIZER COMPANY · Campine · VALLIS · DUTCH INSPECT · ETG

Data in tough environments

Recurring monitoring

Aurubis · nyrstar COTECNA · axpo KIBAG

Challenges for bulk inventories

TINAMU

MANUAL PROCESS

Measuring and counting inventories is still mostly done manually and reported on paper and Excel, leading to errors and low accuracy

SLOW AND EXPENSIVE

Accurate measurements are time-consuming. Results are delivered multiple days after. Trustworthy inspections can only be done occasionally.

TINAMU brings a ground-breaking automation workflow to deliver precise, digital, fraud-free and cost-efficient periodic volume measurements of stockpiles.

Hidden cost of inventory uncertainty

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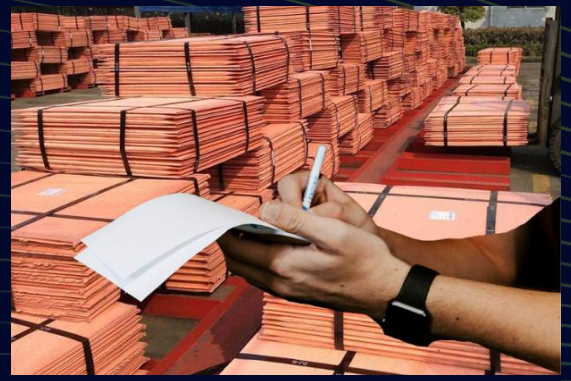

OPERATIONAL COSTS

LOGISTICS COSTS

CONTRACTUAL COSTS

FRAUD COSTS

SUSTAINABILITY COSTS

SAFETY RISKS

TINAMU automation and advanced analytics

Algorithm-based automated image assessment, segmentation and localization

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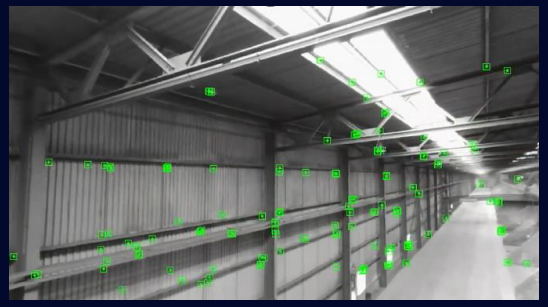
Auto-navigation



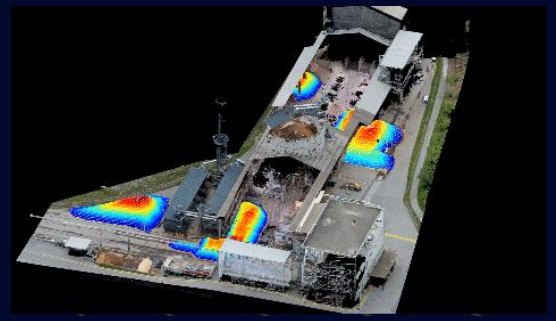
Matching of natural features ✓

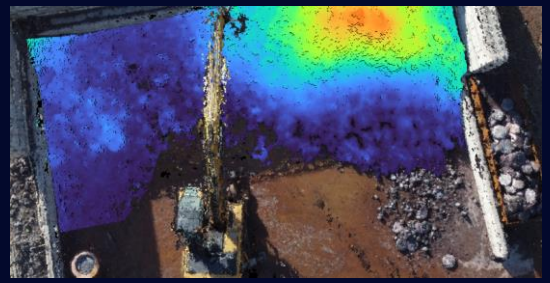
Auto-flight w/o GPS nor pilot ✓

Precise recurring positioning in tough environments (dusty) ✓

TRL 8

Volumetric measuring





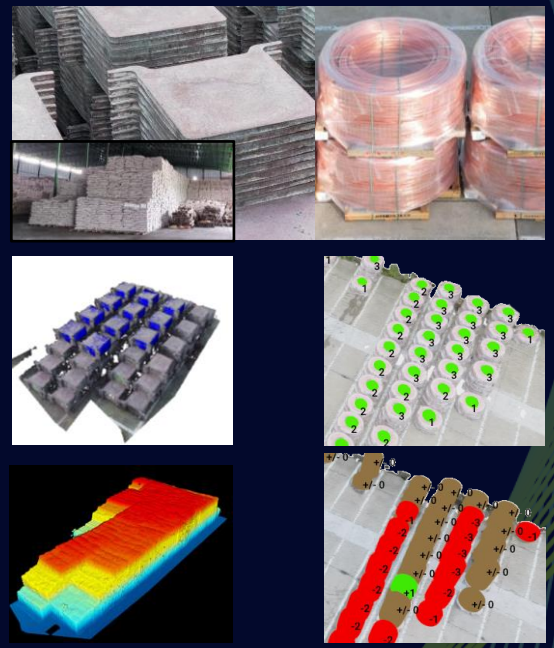
Precise digital volumes ✓

Movements / changes ✓

Implicit densities ✓

TRL 8

Counting



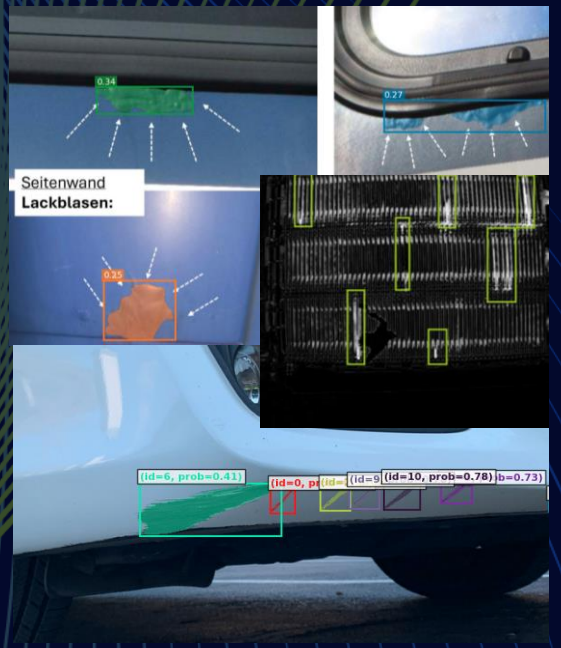
Automated unit count ✓

Automated object detection ✓

Movements / positions ✓

TRL 6

New: *Anomaly detection*



Visual / thermal anomaly detection ✓

Automated semantic segmentation ✓

Position mapping ✓

TRL 4

TINAMU makes drones fly automated by computer vision

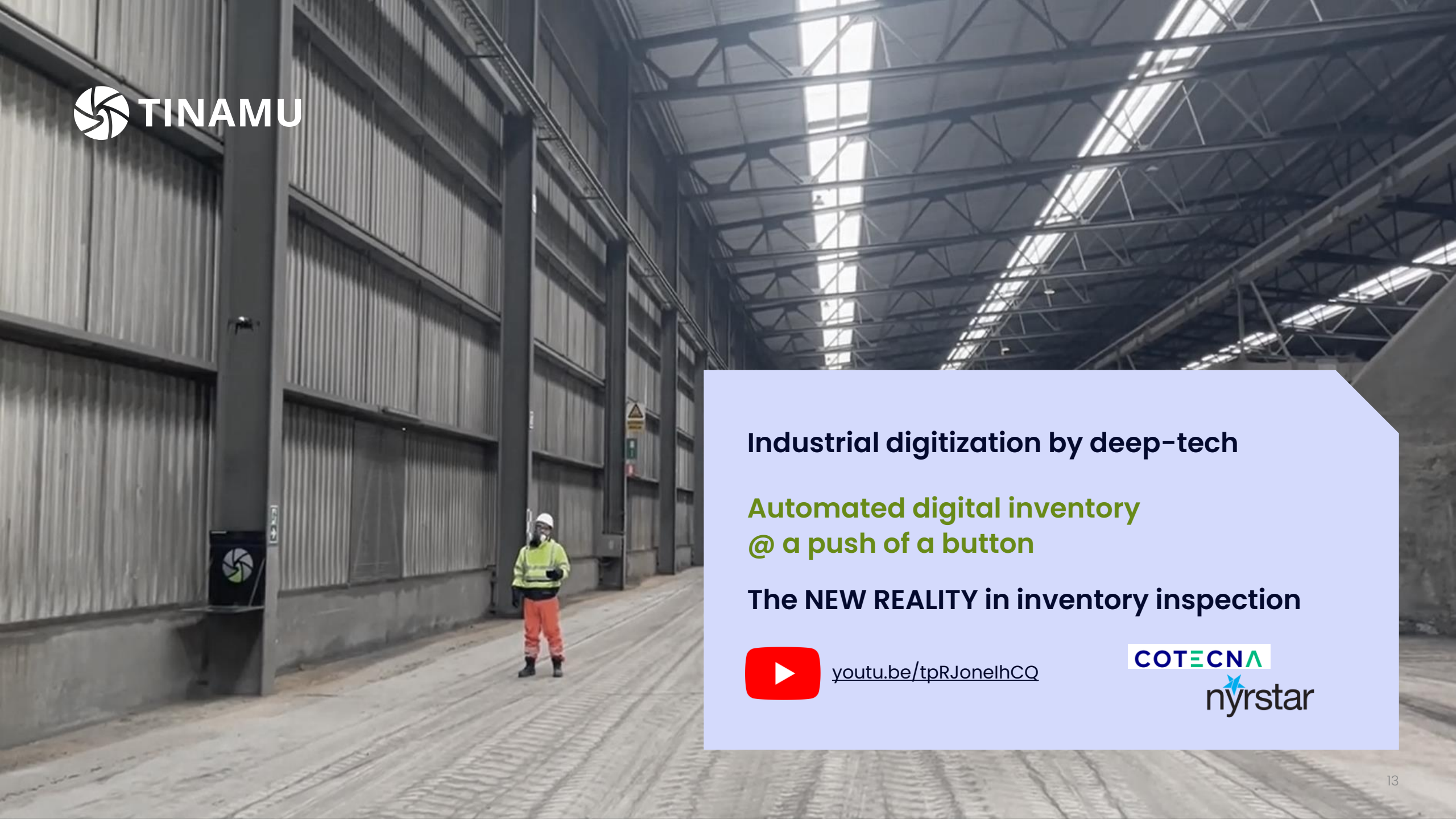
How do we capture new digital data fully automated @ a push of a button

We use available hardware
drones + sensors

Make them fly automated
indoor & outdoor with no GPS

Provide new data insight
automated workflow + bulk algorithm

Flexible sensors to capture data + Advanced analytics = Digitization of traditional industries



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Industrial digitization by deep-tech

Automated digital inventory
@ a push of a button

The NEW REALITY in inventory inspection

youtu.be/tpRJoneIhCQ

COTECNA

nyrstar

We “cracked” automated indoor flying

TINAMU’s history and core innovations

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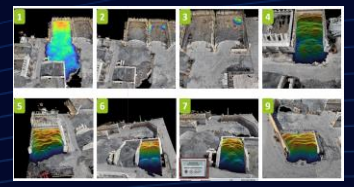
Spin-off
ETH zürich



Dec-18 Virtual Rails™

2020 Infrastructure monitoring PoCs

2021 Volumetric measuring PoCs

2022 **Inventory monitoring MVP*** & 1st recurring customer (Kibag)

2023 **RMS roll-out in Europe** (Nyrstar, Cotecna, etc.)

2024+ **Global roll-out of scalable product** (Aurubis, Imerys, etc.)

100% inhouse development of unique computer vision based software stack to enable drones to navigate in unknown terrain / without GPS = indoor

(“smart” navigation based on camera / pictures)

Note: Many companies with large budgets have tried in the past decade to bring computer vision based navigation to a market ready product such as the TINAMU’s Real-time Robotic Monitoring System (RMS). Only a handful of companies succeeded and TINAMU is proud to be one of the leaders in this field worldwide. We consider our in-house software and the know-how underlying the development as the crucial part of our IP assets in conjunction with the copyright protection on the software.

Industry 4.0 with flying sensors + advanced analytics

TINAMU vision

Capturing of new digital data

TINAMU make drones **fly automated w/o pilots nor GPS in tough industrial environments**

Navigation module

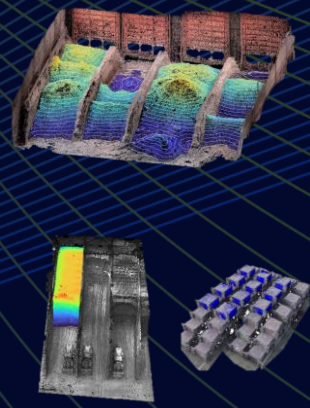
Photogrammetry module

LiDAR module

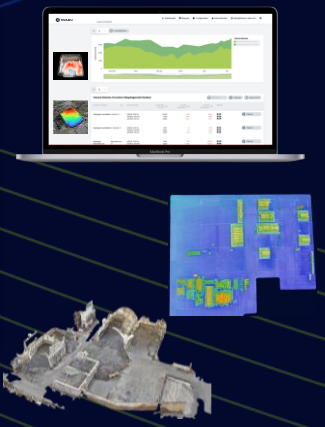
System pipeline:

- LiDAR navigation module for 24/7 automated flights
- Thermal and acoustic modules for anomaly, short-cut & combustion detection
- High resolution and multi-spectral for visual inspections
- Early fermentation module (CO^2, Ammonia, Thermal)
- ...

+ Data analytics as a service



TINAMU provides **new digital data, analytics & insights for a service fee** end-to-end incl. visualization, reporting & dashboard



Volumetric measurement algorithm for bulk materials

Counting algorithm for units such as big bags

Advanced analytics pipeline:

- Visual inspection
- Predictive maintenance
- Density estimations of metals and mineral
- Early fermentation detection for soft commodities e.g. wheat
- Combustion and fire prevention e.g. coal
- Bar code and QR-code reading
- ...

Digitization unlocked by automated flying sensors and advanced data analytics

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TRUST THROUGH TECHNOLOGY