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28 May - 1 June 2023 in Orlando, Florida, USA

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Protecting
Our World,
Conquering
New Frontiers

The application of robotics in construction

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WHY INTRODUCE ROBOTS INTO CONSTRUCTION ?

DIFFERENT TYPES OF CONSTRUCTION ROBOTS

IS THERE ANY ROBOT TO HELP SURVEYORS ON A CONSTRUCTION SITE?

CHANTIER

Protecting Our V

CONSTRUCTION
 ering New Frontiers

PHYSICAL



Digital

PHYSICAL

BIMPRINTER
 Let's print the BIM
 MANUAL STAKE OUT



THE PROBLEM

Arduounous of stake out works
 Very few volunteers
 Lack of skilled labor



Scan and digitalize



Stake out and tracing robots

- Premarking robots



Civ robotics



Tiny mobile robot



Tiker Robot Plotter

Stake out and tracing robots

- Layout construction printer robots



Bimprinter – Dusty Robotics – HP Site Print – Hitachi Sumi Robo - Mirai

Difficult construction environments

The robot prints on:

- Concrete
- Asphalt
- Roofing



Degree of autonomy of the different robots : example of Spot Robot

Common Spot Operation Scenarios for Trimble Customers
 Mix **supervision, autonomy, and teleoperation** in a way that adds value to your operations

TETHERED AUTONOMY	OBSERVED AUTONOMY	UNSUPERVISED AUTONOMY	REMOTE OPERATION
 Operator within controller WiFi range Used to record autonomous missions Can be used to play autonomous missions under close observation for easy operator intervention	 Operator within controller WiFi range, larger lossy range acceptable Used when operator is in vicinity of robot but focusing on other work while robot autonomously captures data Operator can intervene if necessary	 No controller or communication with robot Used when operator is not present and there are no comms on site Missions can be scheduled on robot to play after workers have left the site for cleaner data capture	 Operator arbitrary distance from robot(s) for both teleoperation and autonomous operation Calendar scheduling for multiple types of autonomous missions Scales operator from robot manager to fleet manager

Trimble Boston Dynamics

Credit : Trimble Dimensions + 2022 – Boston Dynamics

How to choose the right layout printer robot?

Total Station compability ?

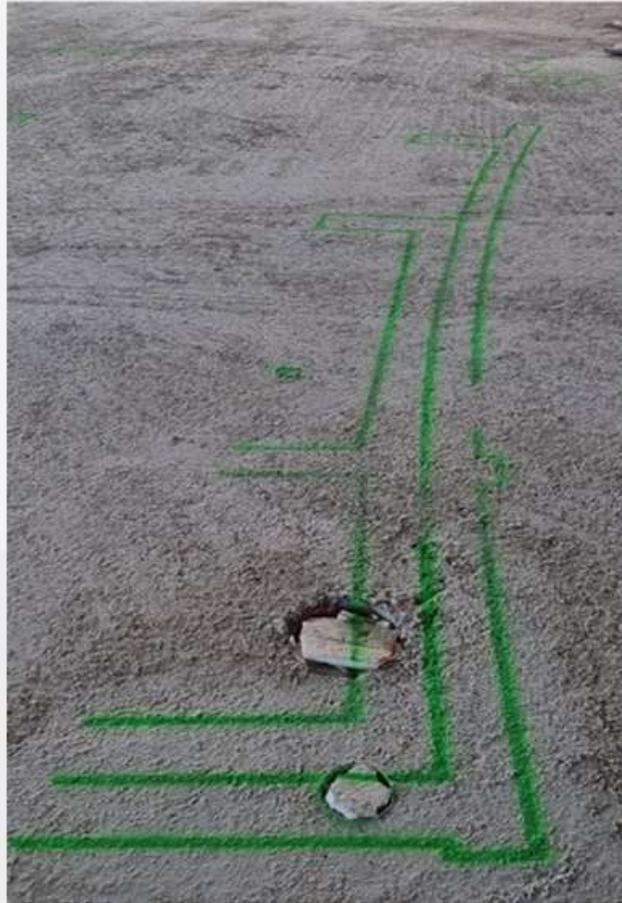
- Leica Geosystems & Icon (Swiss)
- Topcon (Japan)
- Trimble (USA)



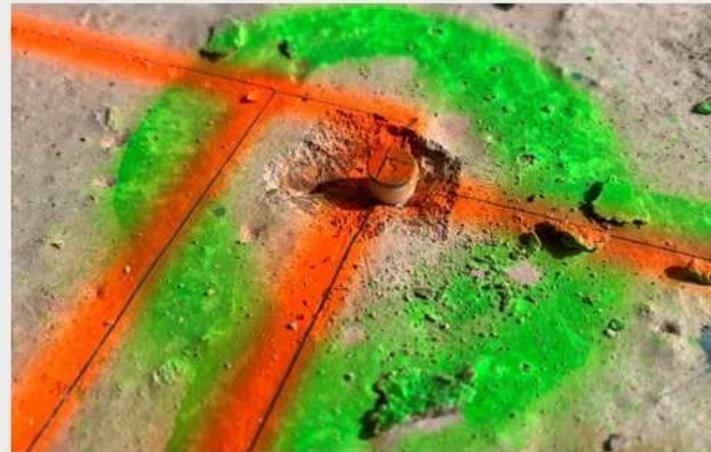
Use cases



Use cases



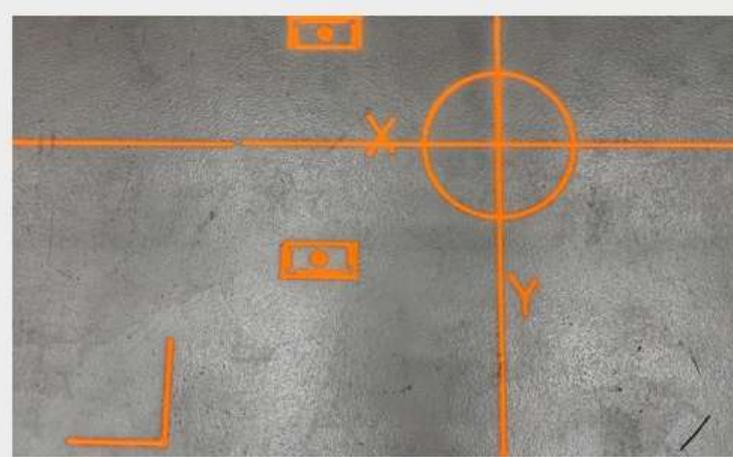
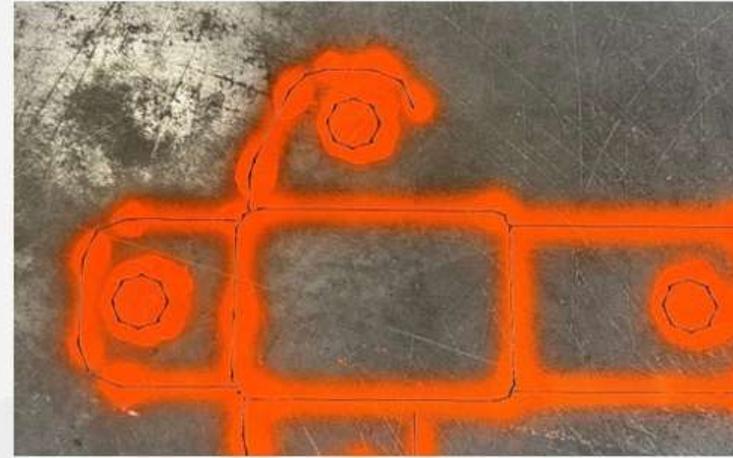
Use cases



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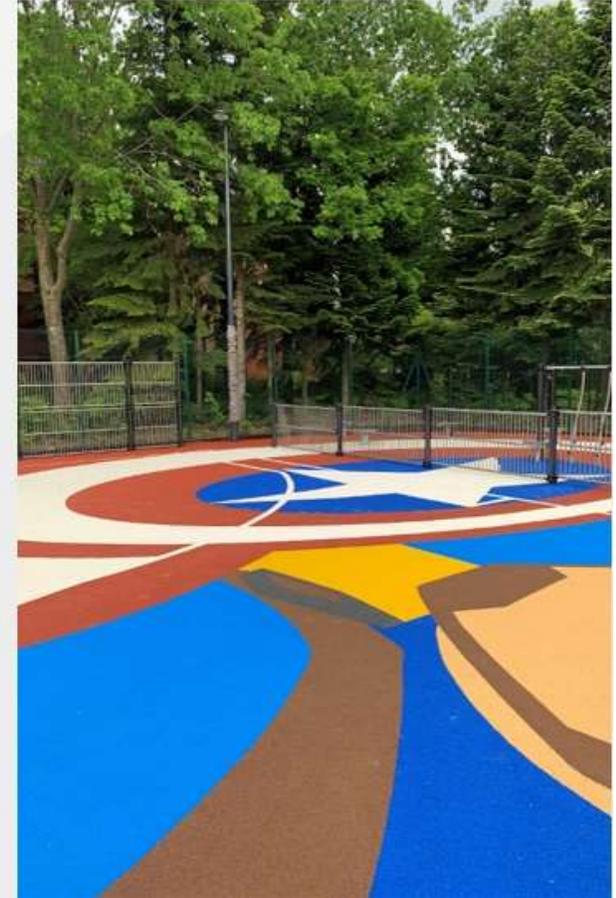
Use cases



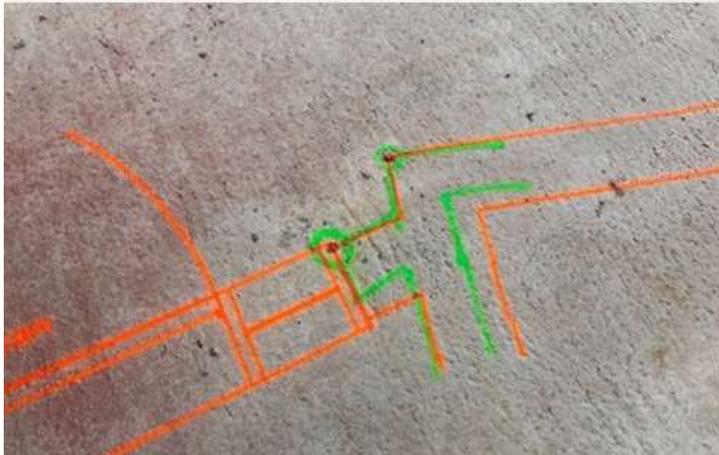
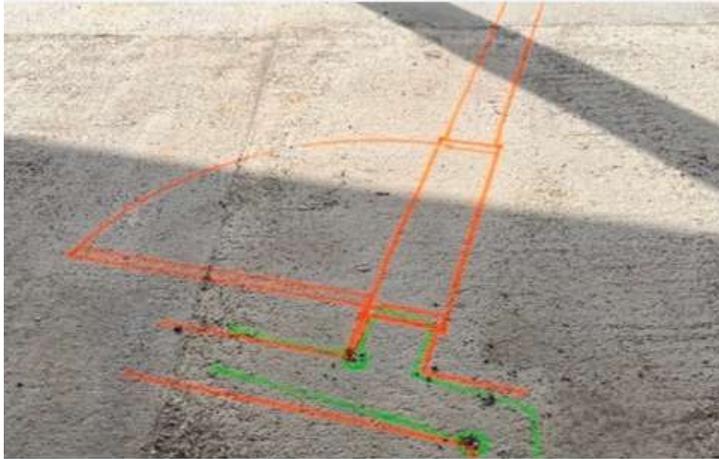
Use cases



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THANK YOU



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We look forward to working with you