



# *Application of Field Robotics on Construction Sites*

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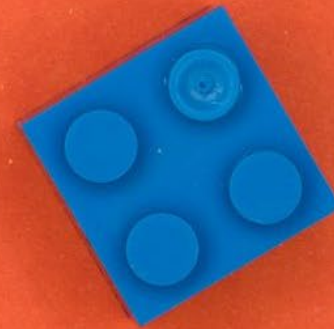
## About Me



- Former DPR Innovation Robotics Leader
- Stanford Ph.D. – invented a novel concrete for extraterrestrial construction
- 15 years in cutting edge construction innovation

DPR Robotics: Mission

**We enable  
construction to  
happen  
anywhere by  
anybody**



# Robotic Tools

Addressing Industry Challenges



Placing robots in harms way

*Move people away from heights and hazardous conditions*  
*Reduce repetitive body stresses*



Jobs for a new workforce

*Extending careers of craftsmen*  
*Attract new talent to construction*



Enhanced jobsite analytics

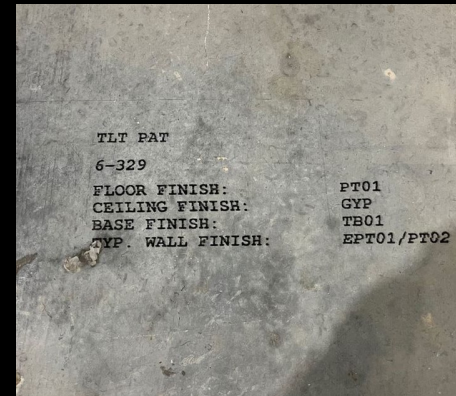
*Production is tracked each day*  
*Machine level quality tracked in building models*



# Dusty

LAYOUT PRINTER

## Adoption



# Dusty Robotics

## FIRST TO SCALE

- Reduced exposure to chalk
- Reduced kneeling and bending exposure
- Reduced stress from context switching
- Near miss with robot operating near edge

Number of Projects

**75+**

Business Units

**ALL**

Peak Robot Count

**7**

Total LF of Line Laid Out

**981,000**

Trained Operators

**30+**

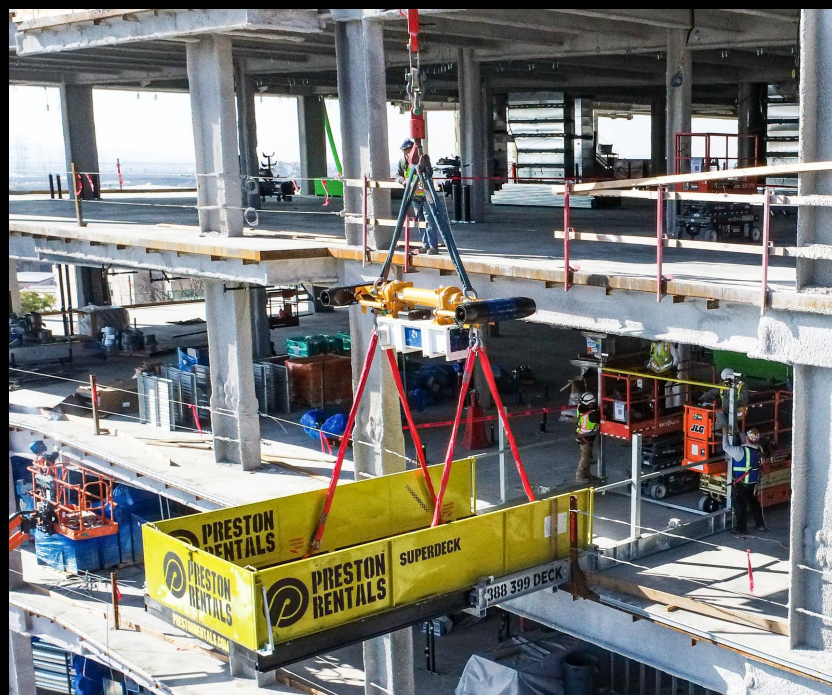
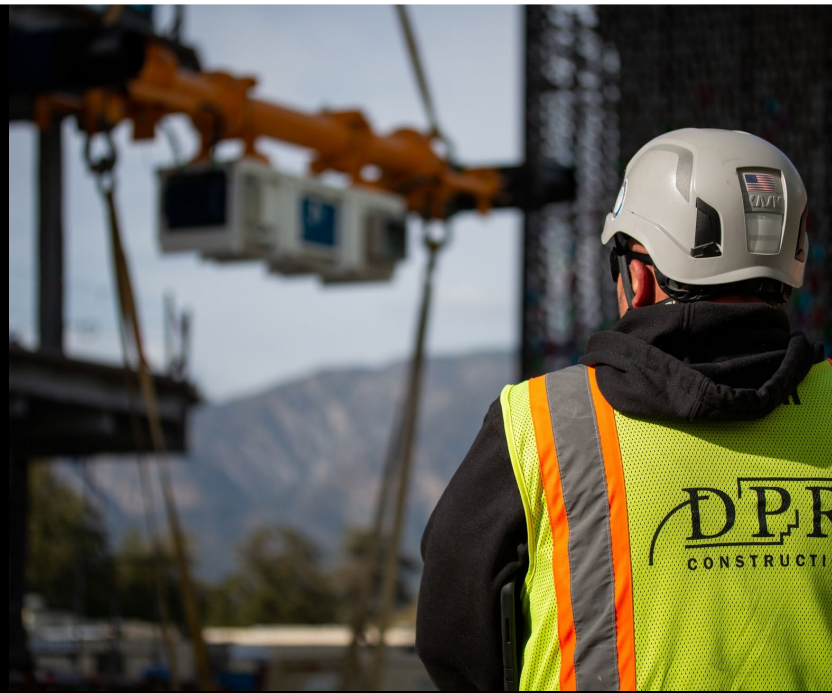
Multi-Trade Projects

**10+**



# Vita Inclinata

Reducing hazards associated with  
lifts





## SAFETY BENEFITS

# Vita Inclinata



### Safer Picks

Eliminates getting caught up in tag lines &  
Load control throughout lift



### Windy Condition Operations

Keeps load stable in windy conditions



### Lifting in Tight Spaces

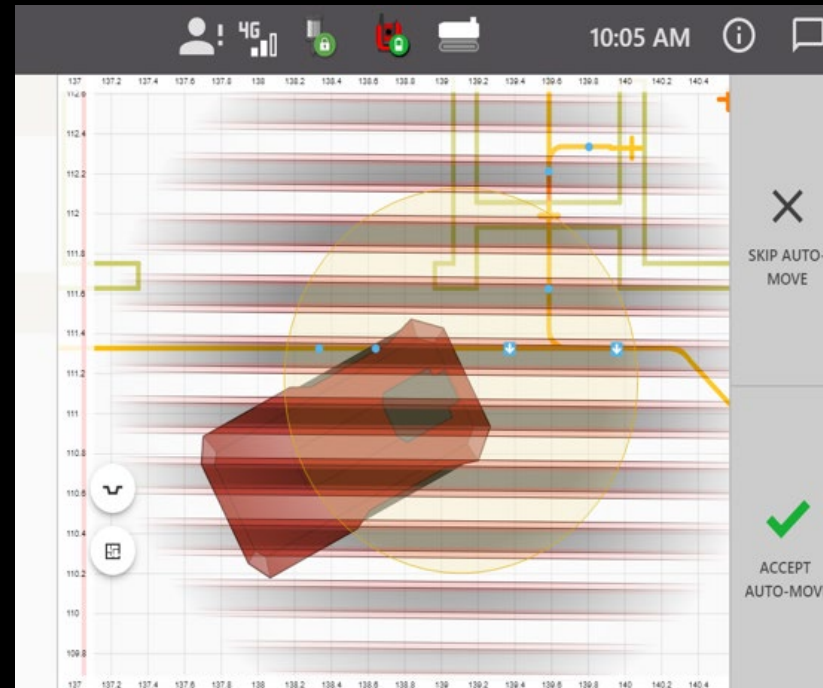
Controlled loads can safely be maneuvered into tight spaces

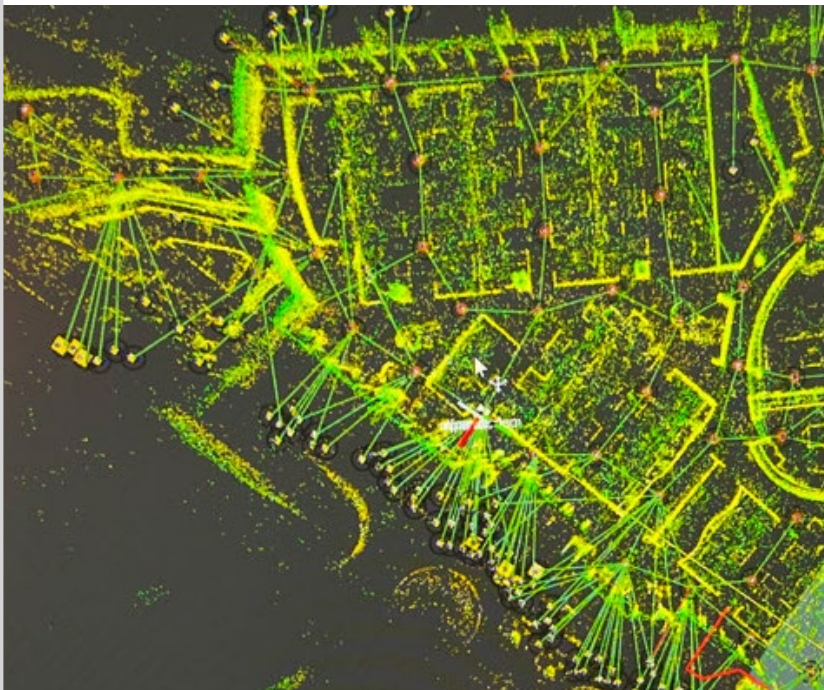
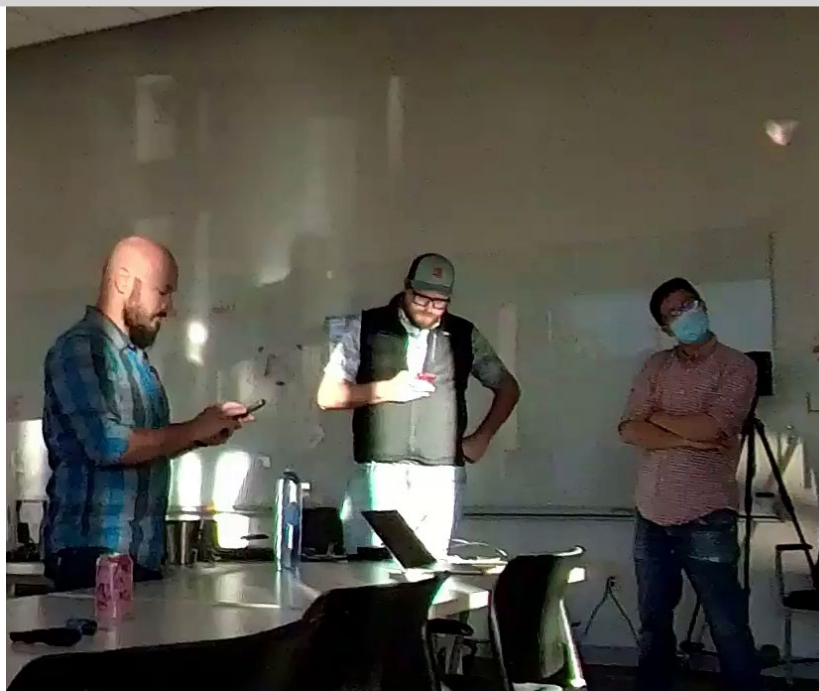
# Hilti Jaibot

Pilot results: 33,000 holes drilled, zero related incidents or injuries

8x productivity gain over traditional methods

Can currently be used in addition to Dusty layout





# FieldAI

Autonomous exploration and navigation

360 photo capture and laser scan data on a frequent and repeatable basis

Enables progress tracking and quality checks

Gateway to autonomous machines on site

# Raise Robotics

Robotic platform for complex/high-risk edge-of-slab functions

Currently able to install clips for curtainwall systems.

## Upcoming Deployments

- Development of concrete doweling task workflow

## Previous Experience

- Recent pilot in Dallas, TX
- Near-miss: dropped bolt lead to development of catching net.



NEW CANVAS CERTIFIED  
FINISHER: JESUS GOMEZ  
OF DPR CONSTRUCTION

“  
There's value in learning new things. Learning how to use this machine makes me more valuable to my company.”

CANVAS

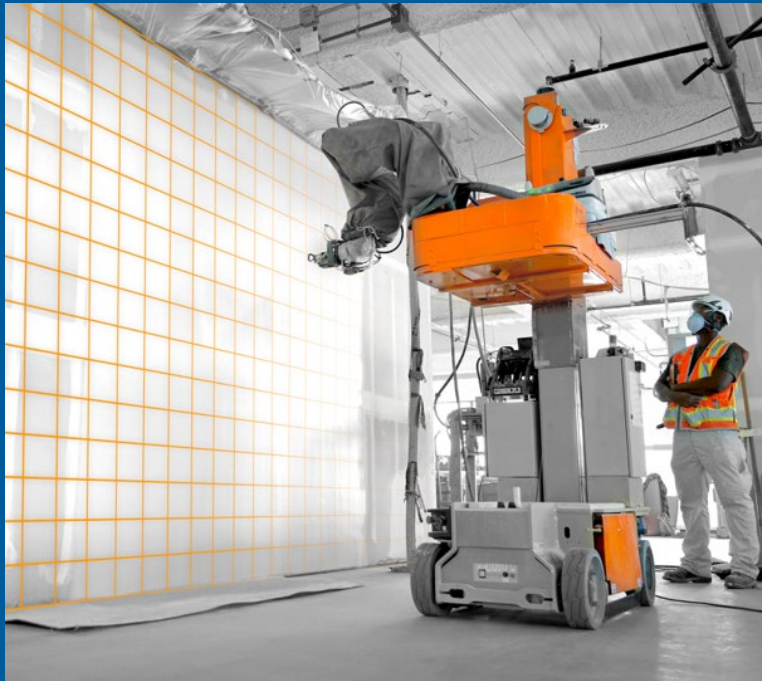
# Canvas

Drywall finishing robot

## Piloting



# CANVAS: Solving Industry Challenges



## Put the Robot in Harm's Way

Move our craft away from heights and dangerous work.



## Reduce Repetitive Stress Injuries

Let robots take the load off and reduce body stresses.



## Reduce Exposure to Silica

Canvas sanding head eliminates 99.9% of silica dust generated by traditional finishing methods.



## Exoskeletons

### POCs

Hilti Exo-01  
SuitX ShoulderX

### Trades

Interiors, ACT crews,  
formwork carpenters

### Results

Many found the suits to be  
'in the way'  
Works better when spending  
a whole day working  
overhead

### Recommendation

Not recommended - suits are  
currently not designed with  
construction needs in mind

# Lessons Learned

- Improvements to safety can be found with every robot tested
- The likelihood of a safety incident is currently low
- Production gets you to scale
- Technology de-risking can take longer than other innovations
- Expect business model to change as products mature







# Henning Roedel

Construction Innovation

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