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# ENERGY IN BUILDINGS

## EMEA 2024

Europe, the Middle East & Africa

FRIDAY - SATURDAY

NOVEMBER 22-23, 2024

@ 9:00-18:00

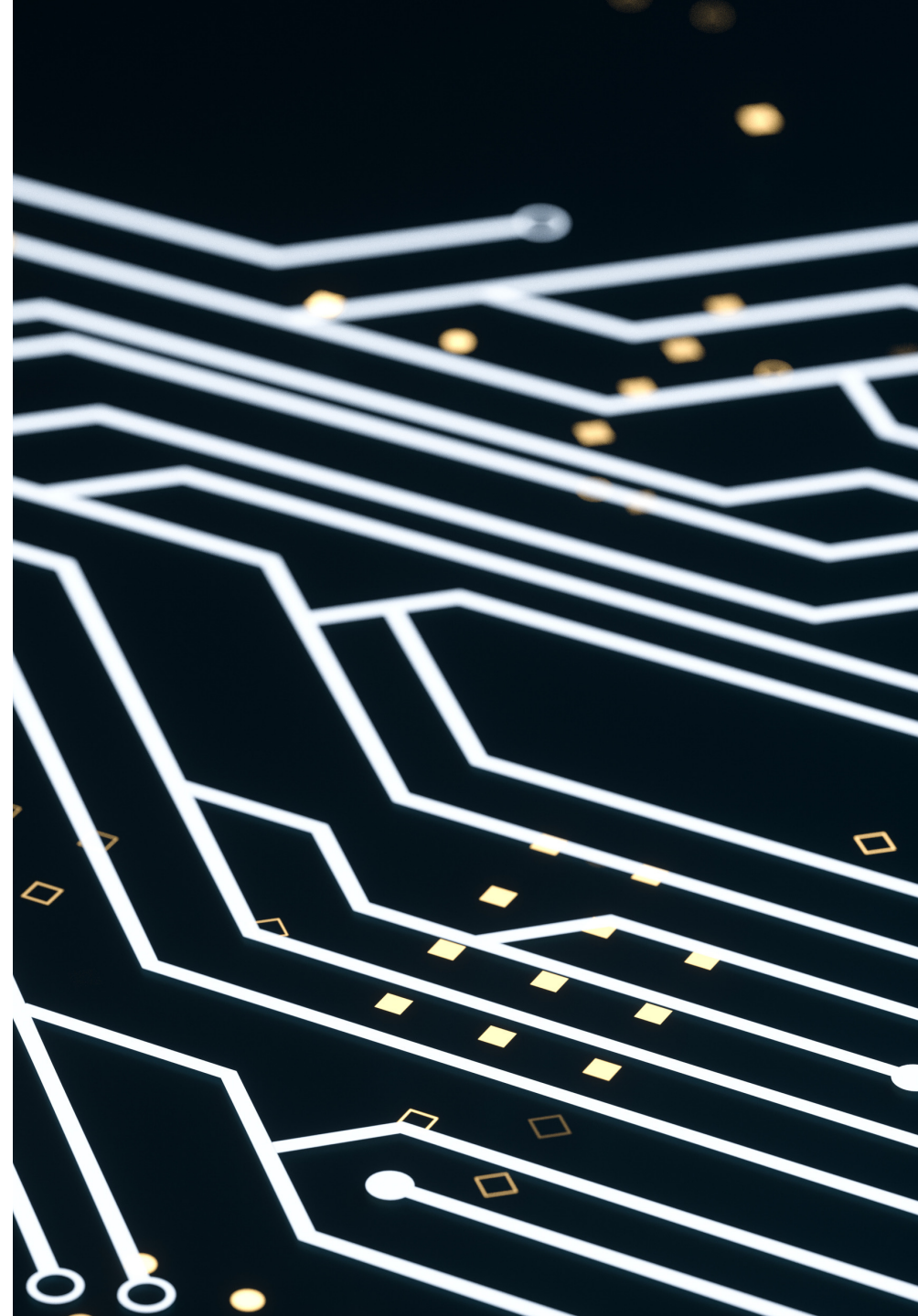
### SESSIONS:

- SUSTAINABILITY
- HEALTH & SAFETY
- DECARBONIZATION
- TECHNICAL SOLUTIONS
- DIGITAL ENVIRONMENT
- POLICIES & LEGISLATION
- ENERGY EFFICIENCY FIRST
- RESILIENCE TO CLIMATE CRISIS

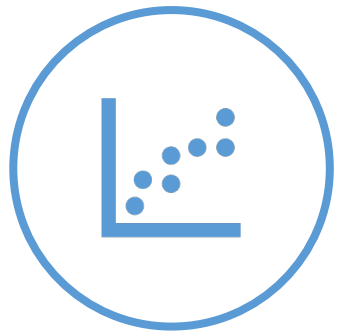
Artificial Intelligence in construction

Artificial Intelligence (AI) is the simulation of human intelligence in machines

It enables systems to perform tasks that typically require human intelligence



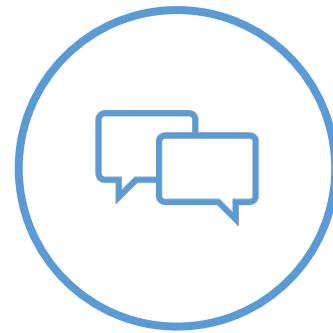
# AI works by combining machine learning, deep learning and NLP



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## Machine learning

System learns patterns from data

## Deep learning

Uses neural networks to process complex data patterns

## Natural Language Processing (NLP)

Enables AI to understand and generate human language



The three core components of Artificial Intelligence (AI)

# AI has multiple use cases in construction, including project mgmt. quality and safety



## Machine learning

Can predict project timelines, budgets, and potential issues



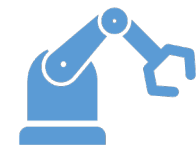
## Computer vision

Can monitor site conditions for safety and quality



## Natural Language Processing (NLP)

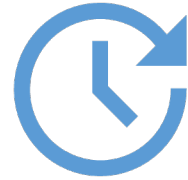
Can analyze documents for quality



## Robotic Process Automation (RPA)

Can automate repetitive tasks to improve accuracy and increase productivity

# How AI can transform today's construction sites?



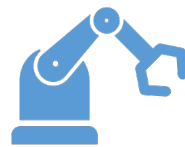
**Predictive analytics**  
Forecast delays and budget issues



**Drones and computer vision**  
Provides remote site inspection



**BIM enhancement**  
Optimizes design through AI-powered modelling



**Robotic automation**  
Automates tasks like bricklaying



**Risk management**  
Assesses onsite safety conditions



**Documentation management**  
Manages compliance and documentation

# AI's data-driven insights can improve scheduling and budgeting, enhancing timely project delivery

Project management benefits



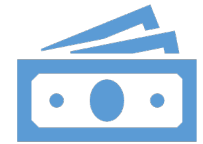
Predictive analytics for timelines

Identifies potential delays early



Smart scheduling

Adapts to reduce interruptions



Financial oversight

Track expenses and costs in real-time

# Real-time monitoring reduces incidents, enhancing worker safety and reducing liabilities

Safety and compliance benefits



Real-time hazard  
detection

Sends alerts to prevent  
hazards



Predictive maintenance

Reduces accident risks



Automated compliance  
checks

Ensures regulatory  
compliance

# AI-driven quality checks ensure high standards, reducing costly rework

Quality assurance with AI



## Defect detection

Identifies deviations from quality standards



## Data-driven insights

Correlates design with defect rates



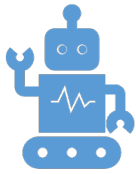
## Continuous monitoring

Maintain high quality standards in real-time



# AI robotics can counteract labor shortages and improve site efficiency

Addressing labor shortage with AI



## Repetitive task automation

For example, robots handle bricklaying, reducing labor needs



## Productivity boost

Allow for smaller crews to complete work faster



## Reduced physical strain

Enhances worker productivity and health

# Improving sustainability and efficiency with AI



## Material optimization

- Minimizes material waste



## Energy management

- Optimizing energy and fuel use



## Environmental tracking

- Measures emissions and resource uses

# AI has potential to reduce total project costs by up to 20%

AI in construction by the numbers



## Design and bidding process

Potential to reduce **project timeline deviations** by up to **20%** and **engineering hours** by **30%**



## Reducing administrative processes

Automating administrative processes via AI (e.g., reviewing work orders) **can reduce construction costs** by **15%**



## Maintenance and supply chain forecasts

By collecting operations data to perform demand forecasting and predictive maintenance has potential to generate **up to 20% in operational cost savings**

Source: Autodesk

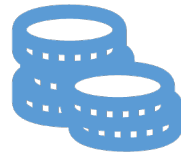
# Addressing challenges of AI in construction is key to successful and ethical AI integration

## Challenges of AI in construction



### Data privacy

Securely managing data and adhering to regulatory compliance



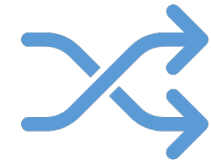
### High costs

Initial setup, training and maintenance costs



### Workforce resistance

Addressing fears around job security



### Data bias

Ensuring unbiased and reliable outputs

# Addressing challenges of AI in construction is key to successful and ethical AI integration

## Challenge

Maintaining data privacy

High costs

Worker resistance

Data bias

## Solution



Protect sensitive data and build comprehensive data protection policies



Introduce AI incrementally to ensure its effectiveness and reduce costs



Upskill workers by providing training to support adaptation



Regularly check outputs for accuracy and fairness

# AI's has a long-term potential to transform the construction industry further

Future of AI in construction



Enhanced collaboration

Real-time, AI-driven platforms



Digital twins

Virtual models of physical assets



Safety innovations

AI wearables and monitoring systems



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# THANK YOU! Q & A

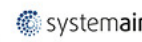
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