# Construction Safety and Productivity: Human-Centered Approaches

## *Introduction*

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*"Safety should never be a priority. It should be a precondition."*

**-Paul O'Neill**

# Introduction: context topic

Construction faces safety and productivity challenges.

Frequent accidents and efficiency losses persist despite regulations and technology.

Human factors such as fatigue, communication, and ergonomics are critical determinants.

Wearable sensors offer real time monitoring for risk prevention.

# Introduction: research problem

Despite technologies and regulations, human factors continue to contribute to accidents and inefficiency in construction.

Poor understanding of how workers perceive and adopt wearable sensors.

Need for worker-centered strategies that improve safety and productivity.


# Introduction: significance and relevance

Contributes to the understanding and design of more effective interventions that are accepted by both workers and construction companies.

Integrates real worker perspectives with technological monitoring to better understand and be more efficient.

Advances knowledge about human-centered safety and productivity.

# Literature Review Summary

- "The Impact of Wearable Devices on the Construction Safety of Building Workers: A Systematic Review" by College of Civil Engineering and Architecture, Zhejiang University, Hangzhou.
- "Wearable Safety Devices: Smart technology use rises on construction sites" By Tom O'Connor.
- "Application of Wearable Devices in Construction Safety: A Bibliometric Analysis from 2005 to 2021” by Ran Gao
- “Using Wearable Technology in Construction to Reduce Incidents” by American Institute of Constructors
- "Proactive behavior-based safety management for construction safety improvement" by Safety Science
- Proactive behavior-based safety management for construction safety improvement bu Science Direct
- Improving Health and Safety in Construction by Harvard University

# Research Question

- Main Question:

How do construction workers perceive wearable sensors, and how can their perceptions inform human-centered strategies to address workplace fatigue, improve safety, and enhance productivity and well-being?

- Why It Matters:
  - Perceptions affect acceptance and successful use of wearable technologies.
  - Insights can guide managers to design more ethical, practical, and effective implementations.

# Research Objectives

- Explore workers’ perceptions of wearable sensors in real construction environments.
- Identify factors (trust, comfort, privacy, and usefulness) influencing acceptance.
- Analyze how fatigue, safety, and productivity interrelate through data provided by wearables.
- Propose human-centered strategies that integrate workers’ experiences into safety and productivity management.

# Significance and contribution

**Why This Research Matters?**

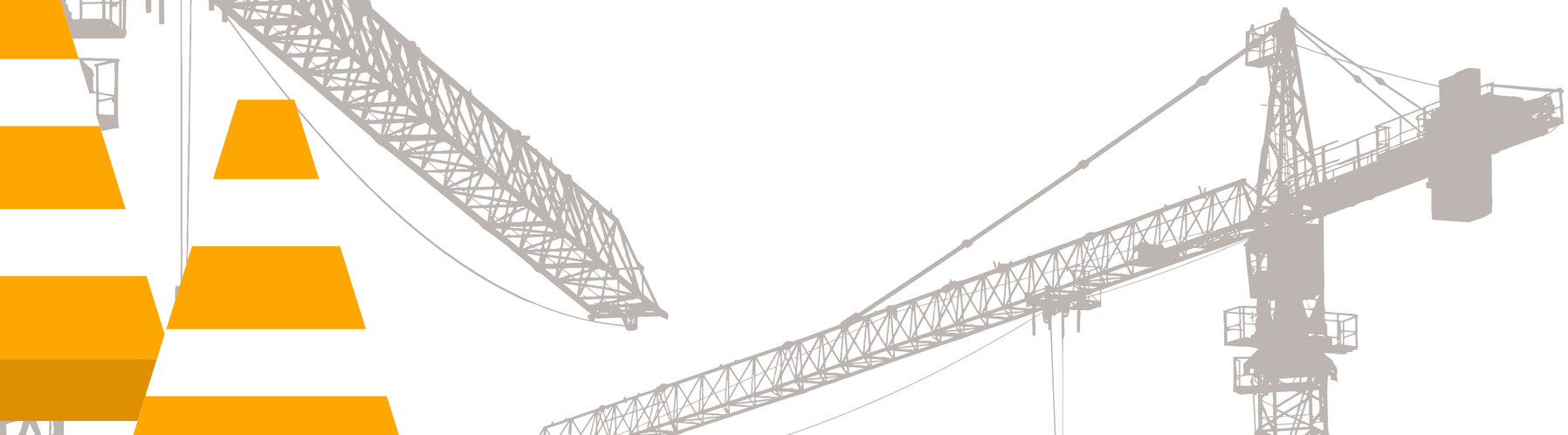
- Addresses a gap between technology design and human acceptance in construction safety.
- Supports evidence-based strategies for managing fatigue and improving productivity.
- Promotes human-centered innovation, integrating worker feedback into technology use.
- Provides valuable insights for construction managers, safety engineers, and policy makers.


# Conclusion

- Construction safety depends on both human and technological factors.
- Wearable sensors provide real-time insights into fatigue and safety conditions.
- Human-centered approaches ensure that workers’ experiences shape technology use.
- The study aims to understand perceptions, address fatigue, and enhance productivity through collaboration between workers and technology.

# Feedback Questions

1. Do you think factors like privacy or comfort have a stronger impact on adoption than perceived safety benefits?
2. What would be the most effective way to measure workers' perceptions of wearable sensors in real construction environments?
3. Do you think focusing on workers' perceptions is an effective way to improve safety adoption in construction sites?



# Thank You!

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