



**The Future of Safety, Health and Well-being (SHW):
From the Viewpoint of Human-Robot Interaction (HRI)**

Applying Robots, AI and Generative AI to Improve OSH

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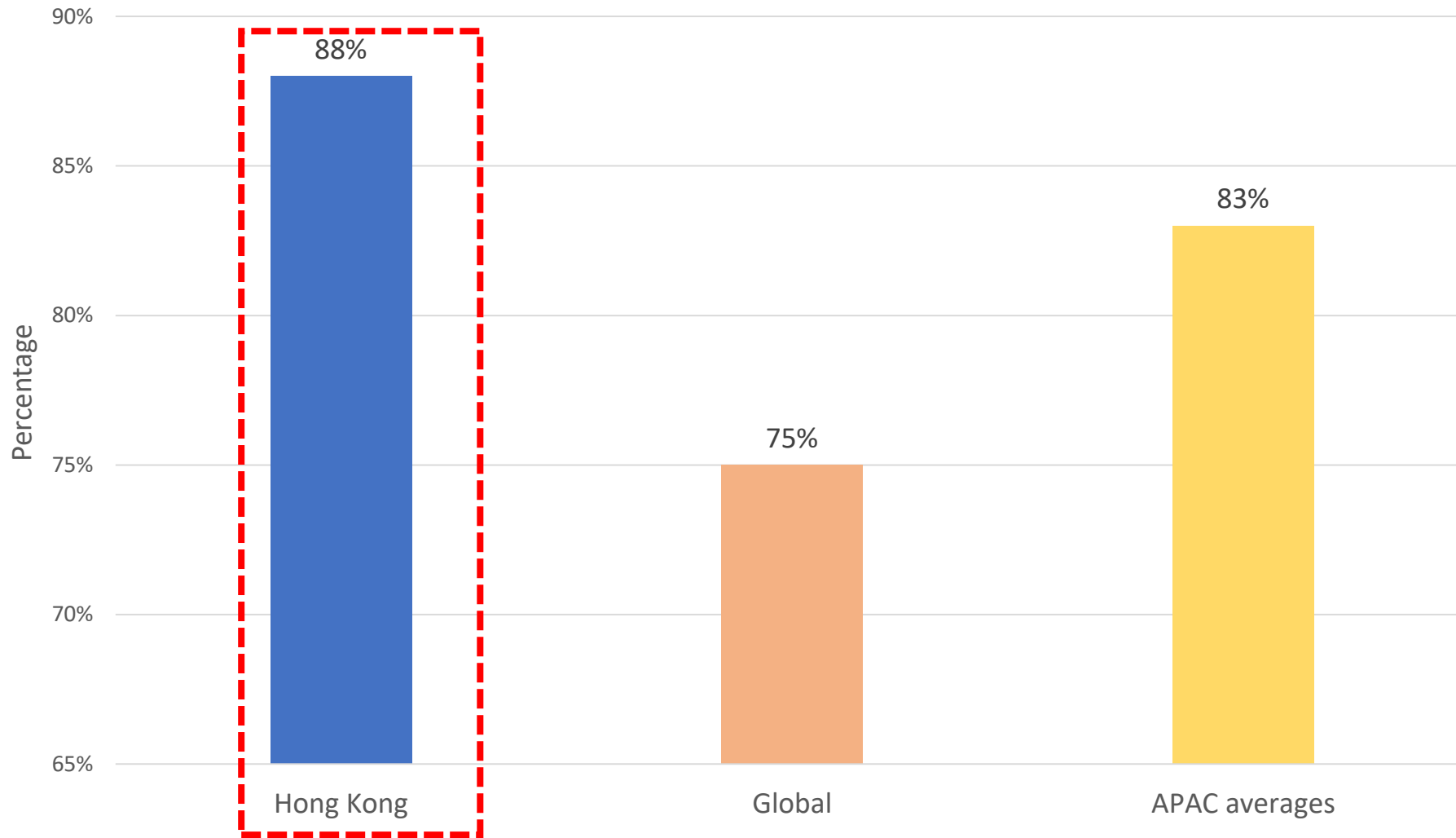
Occupational Safety and Health Council

Hong Kong SAR

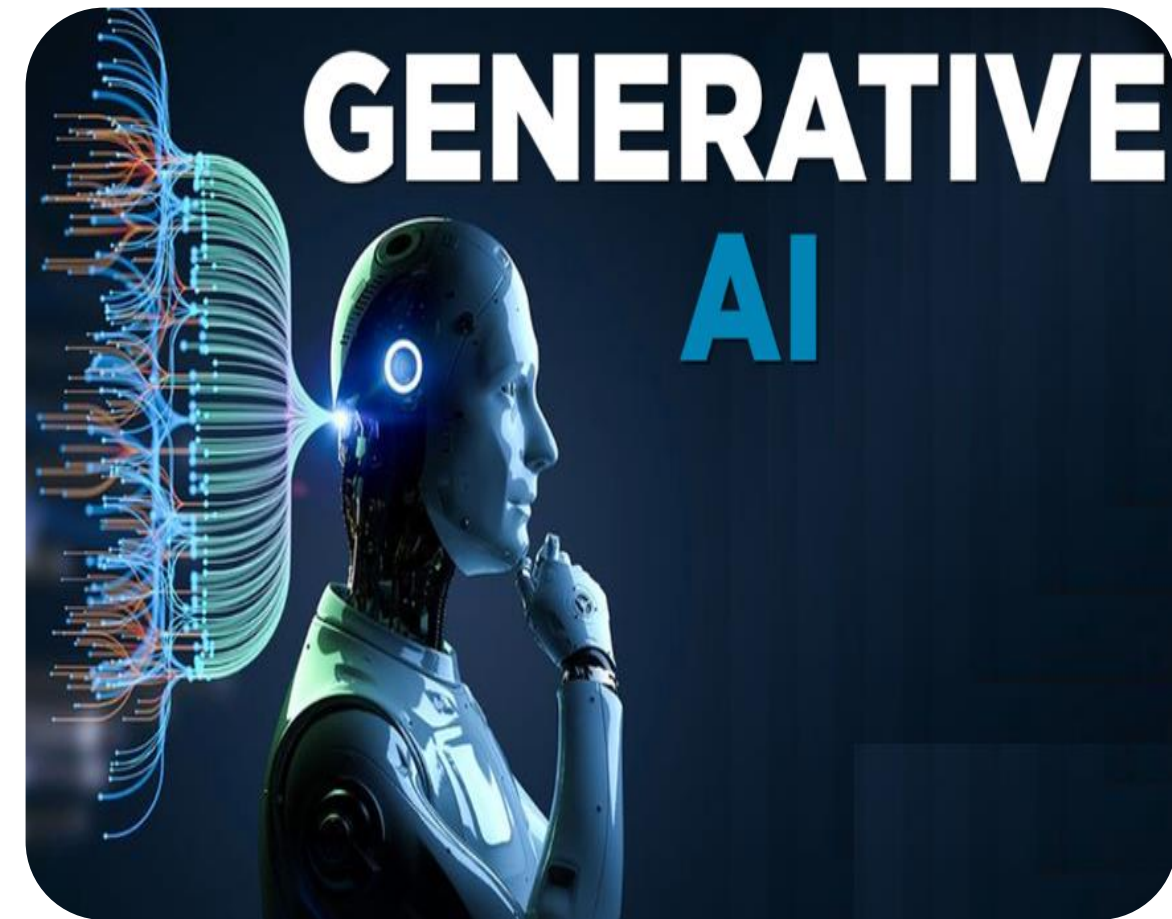


2024 Work Trend Index report on the state of AI – *AI at work is here. Now comes the hard part*

Knowledge Workers Using Generative AI at Work



88% of knowledge workers in Hong Kong use generative AI at work



Reference: Report from Microsoft and LinkedIn, <https://lnkd.in/gyvJwDsk>

Provision of Multilingual Safety Briefings using Generative AI



- Use AI to generate “talking portraits” to provide safety trainings in different national languages;
- Conduct toolbox talks and safety briefings with co-workers of different nationalities.



English

Before starting work, a toolbox talk will be conducted.

Before the toolbox talk, the person in charge should re-check the validity of the risk assessment results.

During the toolbox talk, the person in charge should convey the above risk assessment to all relevant personnel.

After the toolbox talk, all participating workers should sign the toolbox talk record sheet.

Nepali

काम सुरु गर्नु अघि, पहिले एउटा टुलबक्स वार्ता सञ्चालन गर्नुहोस्।
उपकरण बाक्स कुरा गर्नु अघि, जिम्मेवार व्यक्तिले जोखिम मूल्याङ्कन परिणामको वैधता पुनः जाँच गर्नेछ।

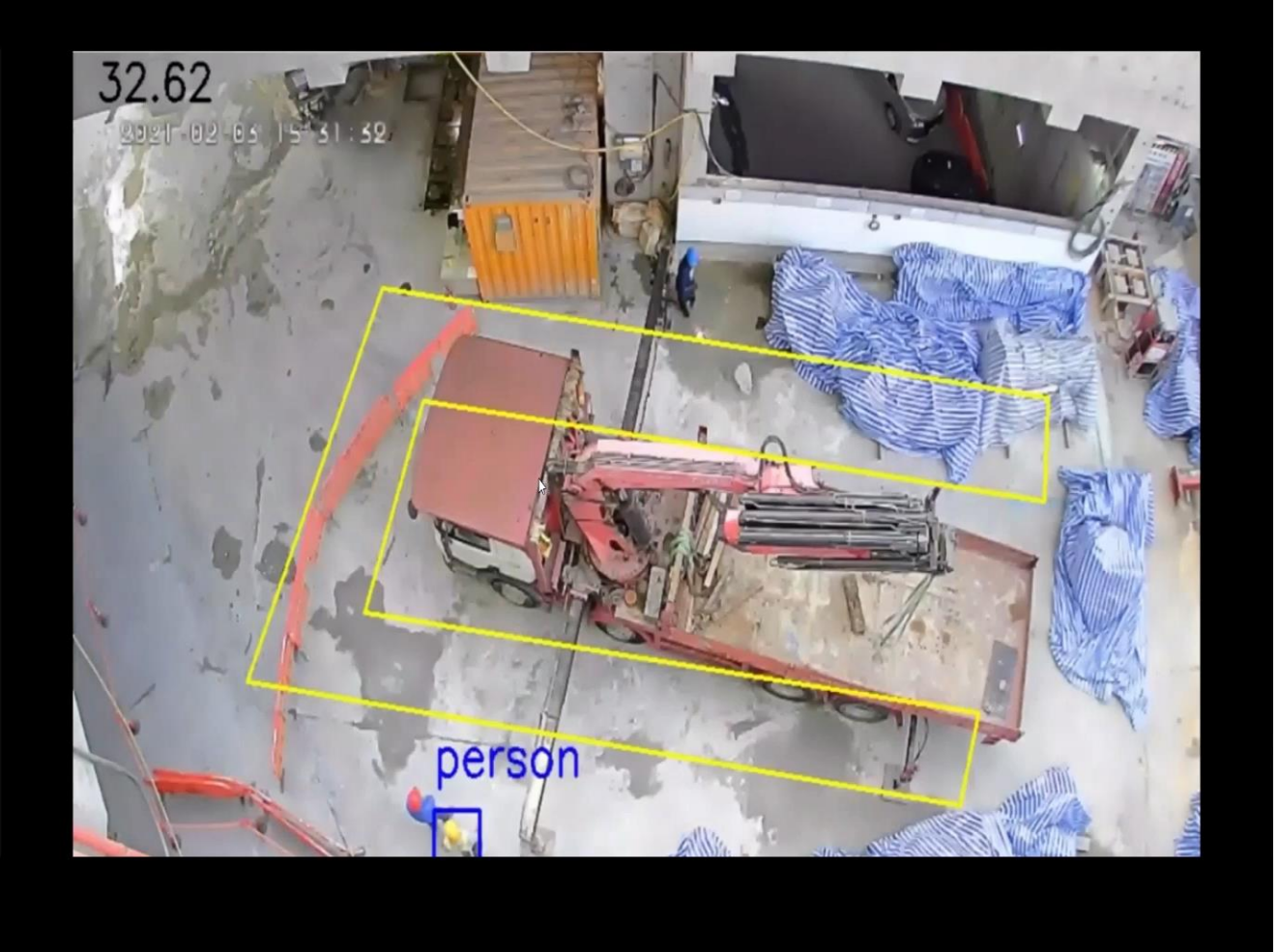
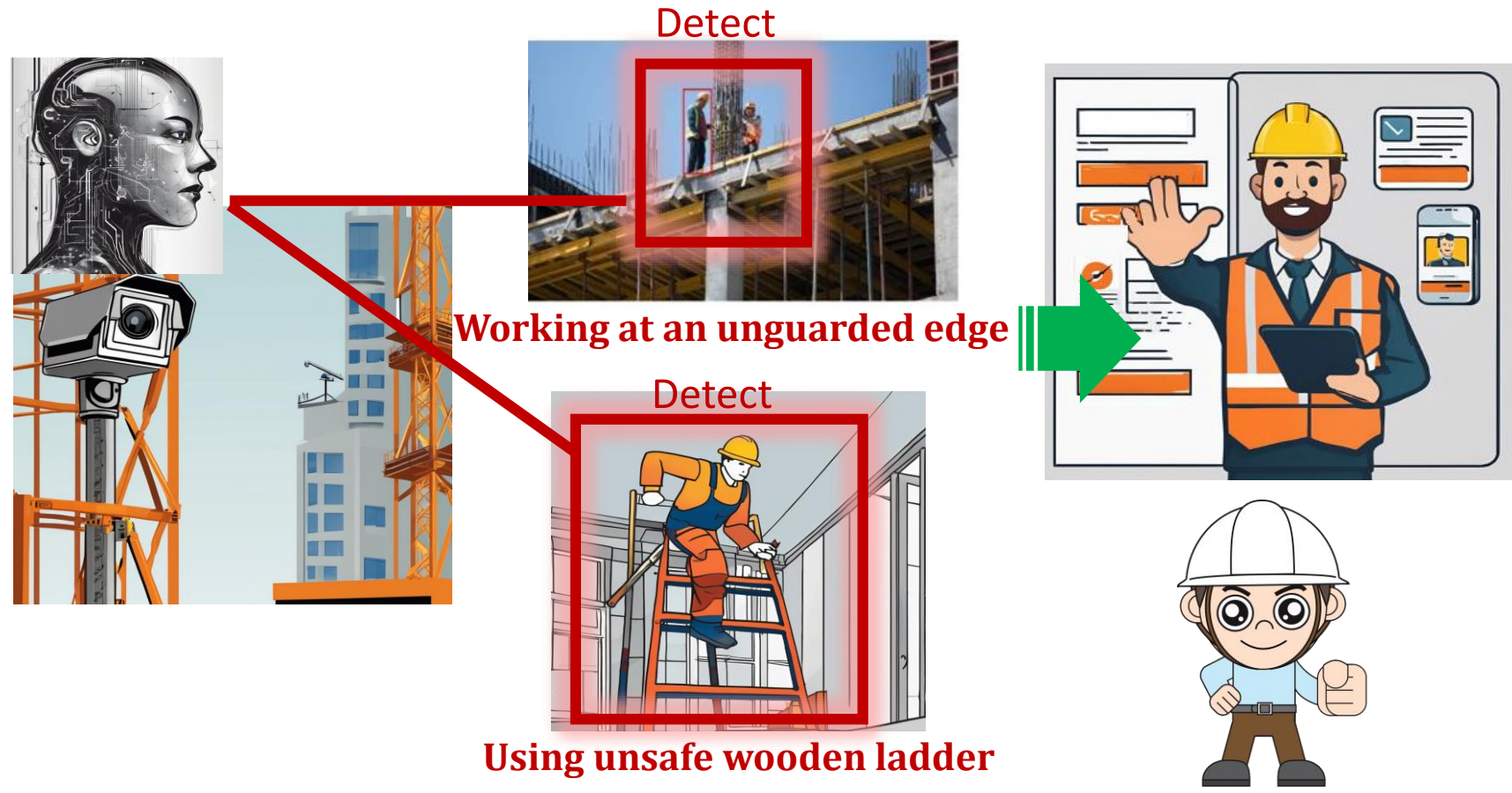
टुलबक्स वार्ताको क्रममा, जिम्मेवार व्यक्तिले माथिको जोखिम मूल्याङ्कन सबै सम्बन्धित कामदारहरूलाई प्रदान गर्नेछ।

टुलबक्स वार्ता पछि, सबै उपस्थित कामदारहरूले आफ्नो नाम टुलबक्स टक रेकर्ड फारममा हस्ताक्षर गर्नुपर्छ।

Virtual Construction Safety Assistant (Generative AI on Vision Language Model embedded with safety knowledge)

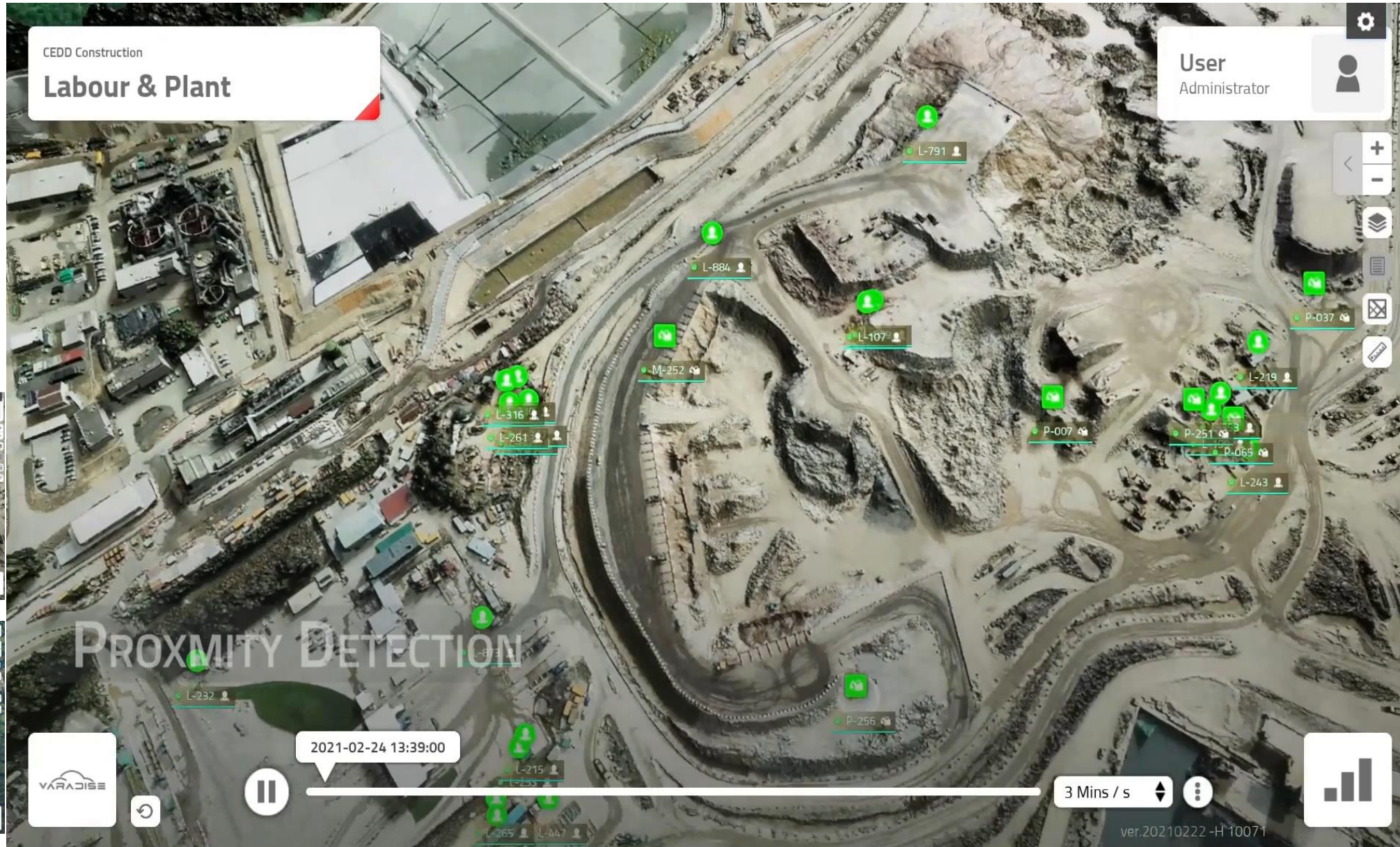
- Vision-based pre-trained GenAI/LLM that embeds safety knowledge from regulations/guidelines & site images
- Advise safety personnel if a safety violation is detected
- Real-time supervise site safety

- Natural language communication
- Like a human “*virtual assistant*”
- **Semantic reasoning capability**

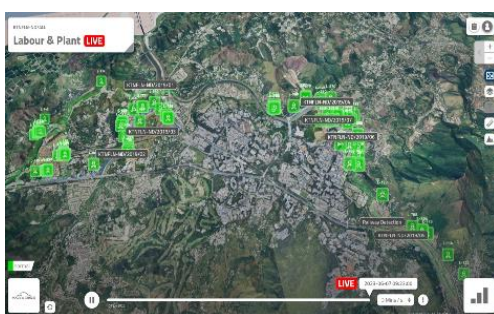


Digital Twin and Digitalised Management Platform

✓ A “*digital twin*” enables project team to real-time *monitor the entire construction site* in virtual space



✓ *Proximity Detection* will trigger alert to supervisor when workers are too close to dangerous equipment or enter danger zones



Performing High-risk Activities using Smart Robotics and Drones

- Eliminating the need for workers to work in dangerous environments

Welding Robot



Demolition Robot



Drones



Current challenges



- **AI literacy among OSH practitioners**

The ability to comprehend, use, interact with, and make informed decisions regarding AI technology in their professional work, including understanding basic principles of AI, recognizing its applications, and being aware of ethical, social, and privacy implications while responsibly engaging with AI systems.

- 101 course and advanced courses on AI/ Generative AI and their applications?



- **Technological advancement outpaces system/ management framework**

- Are our In-house Policy, standards, testing protocols, etc adequate?

Use benchmark tests to evaluate the accuracy of models, employ multi-disciplinary teams to evaluate models prior to deployment, and conduct red teaming to test the security of their models and identify potential risks, among others.?? accuracy?? Reliability?? Bias?? Attack-Proof?? Ethical??

Thank You

Welcome any suggestions!

